ARMY

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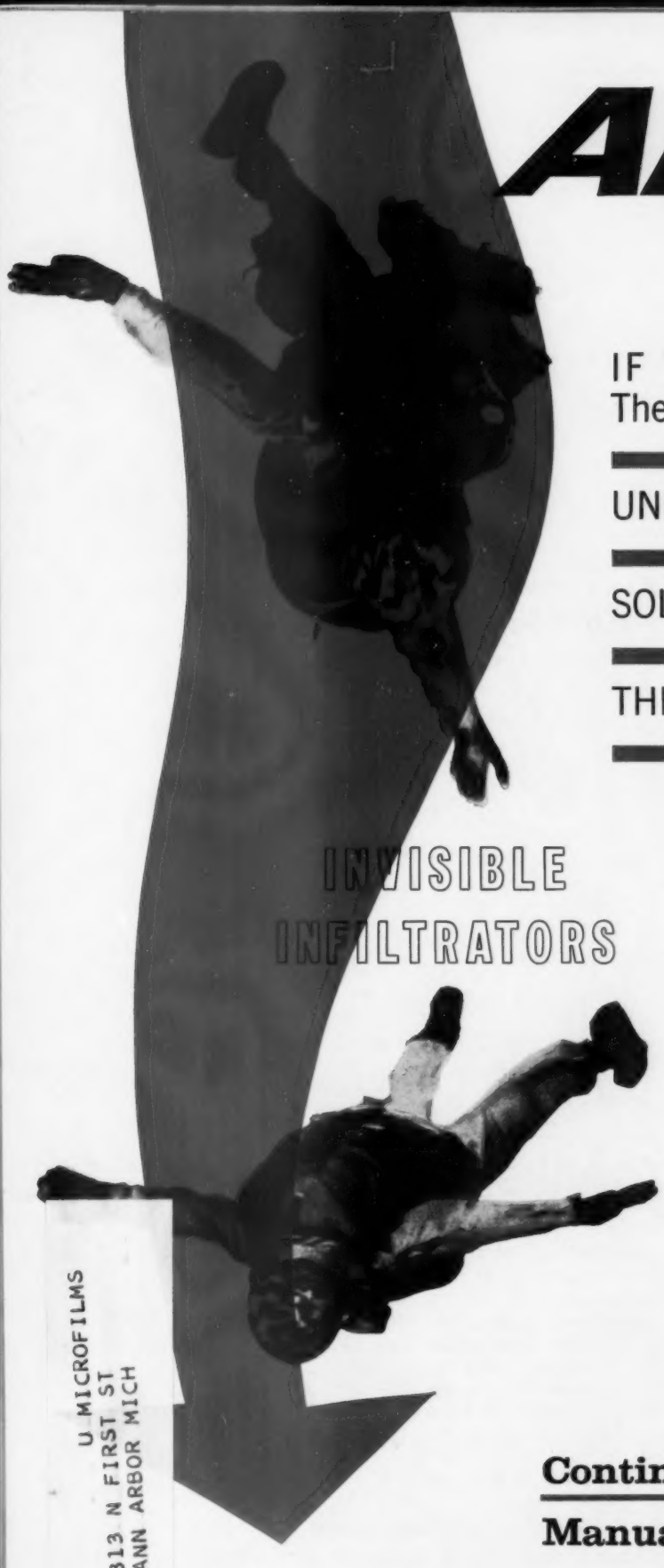

IF THE DETERRENT FAILS
The case for conventional arms

UNIFICATION: how much more?

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THE BOWLING ALLEY FIGHTS

Continuing: Che Guevara's Manual of Guerrilla Warfare

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ARMY

A PROFESSIONAL PUBLICATION DEVOTED TO THE ADVANCEMENT OF THE MILITARY ARTS AND SCIENCES AND REPRESENTING THE INTERESTS OF THE ENTIRE U. S. ARMY

IF THE DETERRENT FAILS. The absence of conventional arms contributes to the terror and instability of today's world. *Arthur T. Hadley* **23**

UNIFICATION: HOW MUCH MORE? With specific modifications, we want to preserve the three services as functional entities. *Col. William E. DePuy* **30**

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MEETING THE COST CHALLENGE. In fielding the Army's weapons systems, cost must be considered in relation to battlefield yield. *Lt. Gen. J. H. Hinrichs* **88**

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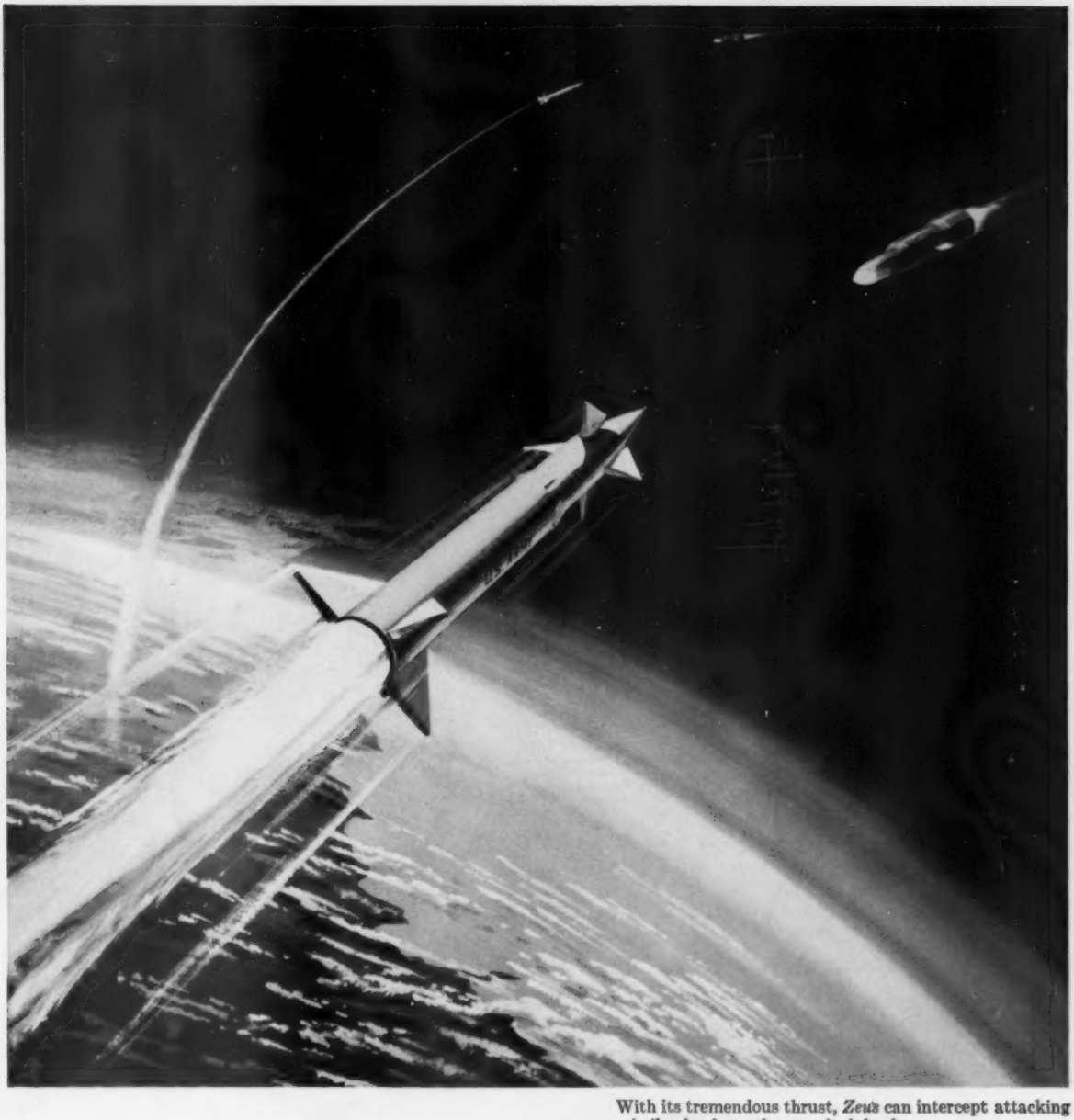

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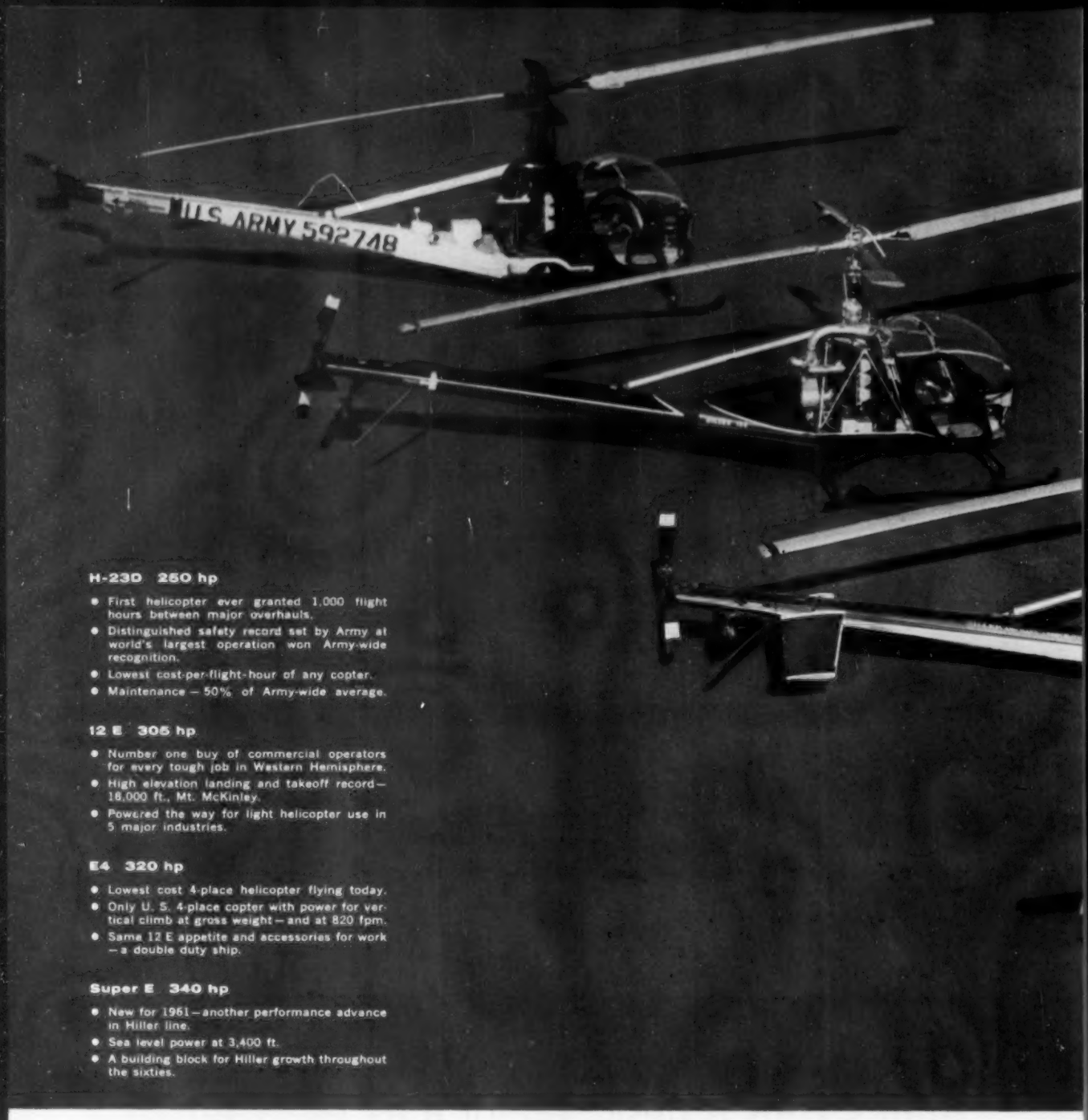

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ARMY letters

A VOTE FOR US

● A vote for "Name Withheld" and his letter "We're Bad and Good" in the February issue.

I like to push the Association on the basis of its fine magazine—not among general officers but in the lower grades who are in the majority and whose dues are good for our cause.

Another vote for Cerebrations, where the little guy and the big one make great contributions. I particularly enjoy the comments of noncommissioned officers.

I believe that tactical support isn't keeping up with the rapid advances in doctrine. Can't you publish something on the subject?

CAPT. F. M. MUELLER, JR.

Aberdeen, Md.

We have. See "Where's Tac Air?" (February 1961); the whole issue of November 1960, and that of September 1960; "Logistic Mobility Today" (August 1960); "Lifelines of Survival" (May 1960); and "Mobile Supply" (February 1960).—THE EDITORS.

WHICH SMITH?

● On page 71 of the February issue the author of *"Petrita's* Command Reconnaissance" says that Captain E. Kirby Smith "lost his life at Molino del Rey." If he did, who commanded the Confederate Trans-Mississippi Department with the rank of four-star general during the War of the Rebellion?

STERLING E. LANIER

Philadelphia, Pa.

Charge this to a nodding editor who should have known better. It wasn't Edmund Kirby but his elder brother, Ephraim, who died 11 September 1847 of wounds received at Molino del Rey. Ephraim used the name E. Kirby Smith; curiously, Edmund adopted that form after his brother's death.

As for four-star rank, the Confederacy never got around to differentiating between general officer grades. All general officers wore three stars within a wreath—not on shoulders, but on lapels and collars.—THE EDITORS.

DAMMING THE DOLLAR DRAIN

● If you can forgive a fogie for harking back to the Old Army, I advocate an almost painless means of damming the dollar drain.

In pre-draft days, the professional Army did not pay the clothing maintenance allowance monthly, but at the end of a soldier's hitch. The soldier was required to maintain his uniforms and have his shoes repaired out of his own pocket. Replacement articles were charged against his clothing allowance, so you'd better believe that we took more care of our personal wearing apparel. We never missed the accrued money and it made a comfortable nest egg at the end of an enlistment, even in those depression days.

I suggest that, since the annual $64.80 closely approximates the $80 per person saving suggested by the Defense Department, the Army simply withhold the clothing allowance during a soldier's overseas tour and pay it off immediately upon his arrival in the Z1. For a bachelor it would make a nice piece of leave change, and, coupled with the dislocation allowance, the married man would find it a godsend in defraying expenses of a PCS.

SGT. HAHN FUGELMAN

Washington, D. C.

WHAT GOOD IS THE RBI?

● I disagree with Major Thomas W. Bowen's article "What Good is the RBI?" [February]. I am critical of shotgun blasts in the form of statements of conditions rather than principles to be observed in preventing the development of conditions which are not documented to support the pulling of the trigger. I agree that it is bad management and an indication of poor leadership for a commander to require an RBI for the pure sake of having something in writing. However, I feel that Major Bowen's article doesn't describe conditions, and that the impression left by his article is not good.

What the article says may have been true years ago, but it is not true

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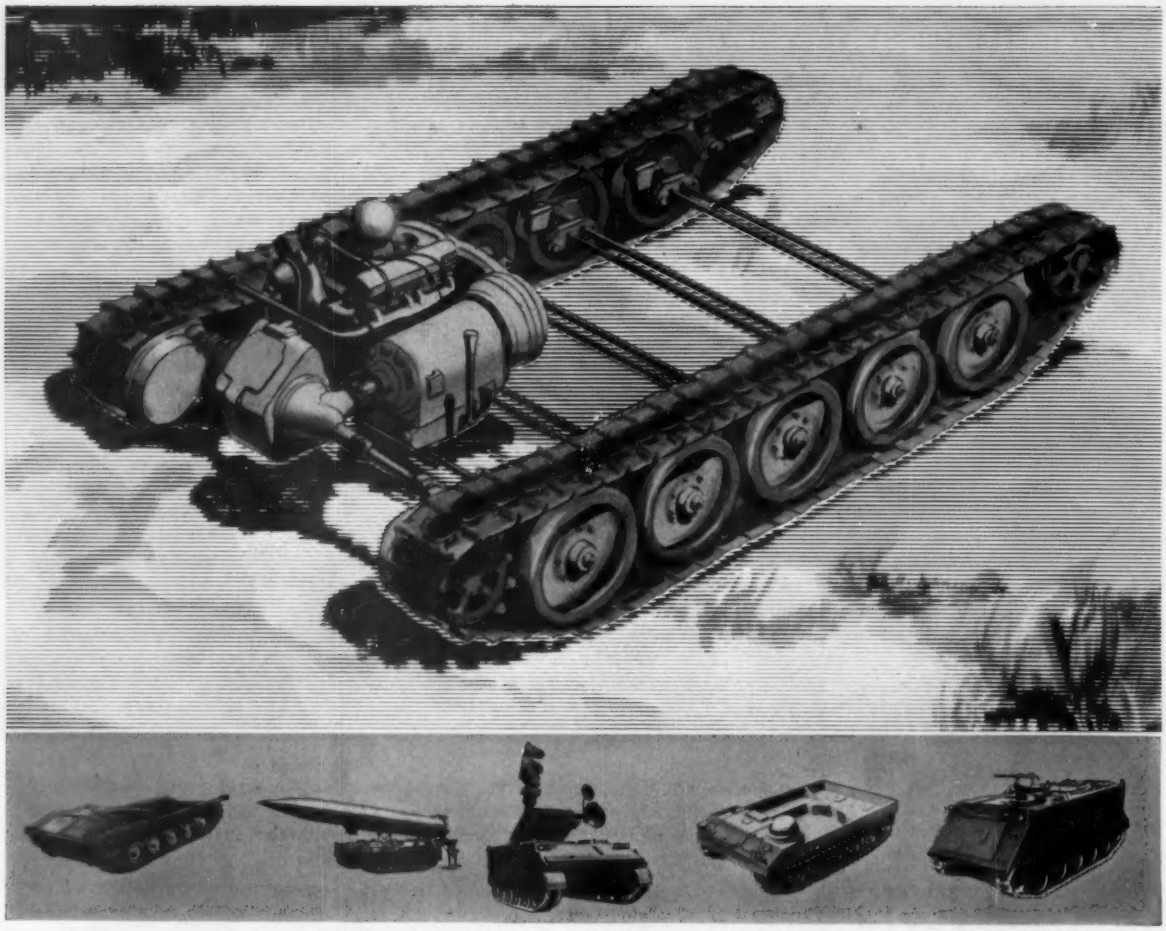

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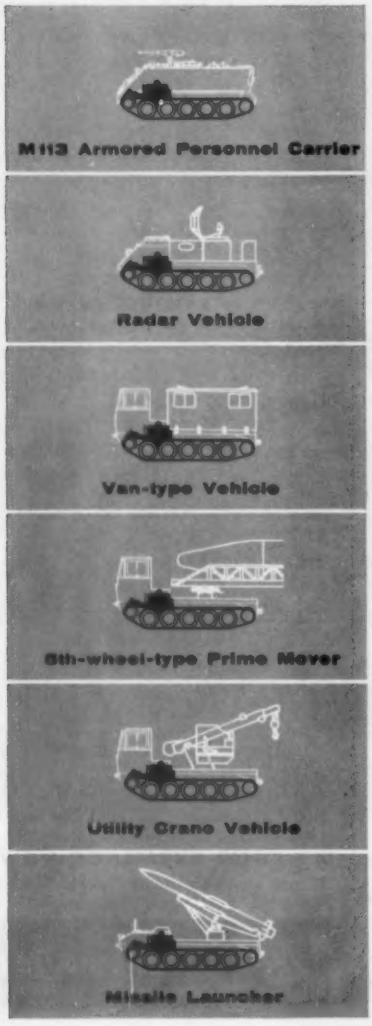

LETTERS

today because of the very intensive effort to reduce paperwork. In those days RBIs did comprise a large part of the unnecessary paperwork.

I think readers should view Major Bowen's article in true perspective as being a principle to be observed rather than as a condition that is prevalent.

CAPT. BEN L. WALTON
Fort Riley, Kans.

FOR SOUTHERN FRANCE VETERANS

● During the middle of 1961 I hope to finish a book describing the invasion of southern France by Allied forces. I am anxious to include as many as possible of verbatim reports from men who participated in the landings.

My address is: Editions Robert Laffont, 30-32, rue de l'Université, Paris VII, France.

JACQUES ROBICHON

FOR 7TH DIVISION VETERANS

● During our actions in the Korean war, several valuable books dealing with the history of the 7th Division were lost. They are: *The Hourglass* (our World War II History by Edmund G. Love; *Island Victory*, by Brig. Gen. S. L. A. Marshall; and *The Capture of Attu*, issued by the War Department through Infantry Journal Press. All are out of print.

Anyone wishing to contribute copies may address them to Information Officer, 7th Infantry Division, APO 7, San Francisco, Calif.

MAJ. HORACE E. PIERCE

MORE TALK OF AIR SUPPLY

● "Battle Group Aviation Team," in the October issue, is good so far as it goes, but there should be more discussion from time to time about air logistics, and the means to carry it out.

During one of the last Chinese flaps in 1953, my ammunition supply point was doing the usual land-office business. The phone rang. "That you, Conlon? This is Colonel Hensley [G4 adviser to ROK II Corps]. We need to supply some positions with ammo by helicopter, in the following amounts. . . . Make sure each load has some of each [MG, rifle, and grenades]. Send the paperwork afterwards. Can you do it in 30 minutes? The first one will be in a couple of minutes."

We could try, for sure. There was a hurried discussion between the depot officer, the interpreter, and myself. A truck roared off to the grenade storage, and the rest of us took off to the small-arms area on foot. A chopper came in at treetop level and settled in a flurry of dust. One of the crew chiefs dropped off with cargo nets and showed us how to load and hook up, and we started bundling 600 pounds per net in a rush. By the time we got a few set up, the first one was in to load and I dashed in and grabbed the hook.

Things being pretty hot, we had the same job to perform several other times, and it got to be more or less no sweat toward the end. The G4 adviser would call, we'd move out on the double, and soon another show would be on the road.

For continuous refills where the enemy isn't in control of the air, the ground vehicle has it. The air stuff shines when the roads are snowed in or blown, or don't exist.

Choppers are versatile, but subject to trouble because of their construction. Maybe they didn't suit the USAF a few years back, but low and slow flight is as useful in its field as Mach 3 is in its. STOL and VTOL add a few more arrows to our quivers, if they come in time.

CWO JOHN P. CONLON
Newark, Ohio

EARLY STIMULATION LACKING

● Colonel Fudge has certainly discussed a pressing problem in "Paging Colonel Mahan" (January). No marked improvement, however, will develop from the establishment of Military Study Fellowships for two select officers. The lack of writers on profound military subjects results from the lack of intellectual stimulation in this field during the early period of an officer's career.

I propose a solution that might also solve one aspect of the compulsory ROTC controversy. A segment of the pre-commission education of cadets should include at least a one-semester course in military history and theory taught by a respected professor. The program could include lectures, readings from military philosophers such as Saxe, Clausewitz and Jomini, and a research paper.

Thus the young officer would be exposed at an early age to the thought-provoking study of military art and theory. If the course were maturely presented and kept on the academic level of his other work, interest in this study would be generated. Over

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LETTERS

a period of 20 years, the result would be not only an increase in military writers, but also a larger and better informed number of readers.

LT. BRIAN J. BOSCH
Fort Ord, Calif.

BATTALION TYPE ORGANIZATION

● I heartily agree with the author of "Gap in Command" [Cerebrations, February]. It would be a most radical step and one hard to swallow for the infantry to adopt the combat command separate battalion type of organization, particularly so after all the publicity on the battle group as the answer to atomic warfare. Having been in armored infantry, I believe that that proved, sound, flexible organization should be adopted forthwith.

As an alternative, I believe a return to the regimental system is preferable to the battle group organization. Additionally, I recommend that the current battle group be commanded by a lieutenant colonel and that his staff consist of a major (executive), a captain (adjutant and S1), captain (supply officer and S4), captain (intelligence officer and S2), and a major (plans, training and operations officer and S3). I would eliminate the deputy commander as a superfluity, a luxury.

This alternative solution would be a step in the right direction and would alleviate somewhat the current gap in command. The real solution, of course, lies in adopting the armor concept.

COL. H. ASHTON CROSBY
Fort Campbell, Ky.

MOS FOR INFANTRY

● Lieutenant Richard N. Gereau's article on the all-encompassing nature of MOS 112 ("The One-One-Two Craze," February) aptly points up the serious inadequacies in our current MOS structure for infantry.

While I do not advocate the use of suffix digits to MOS 112 as proposed by Lieutenant Gereau, I vigorously support his contention that now is the time to act. The urgency of this need increases daily with the standardization of new infantry weapons and related equipment. Any further delay in creating a new MOS group for infantry will serve to invalidate the entire purpose of the MOS structure and threefold objectives stated in the first paragraph of AR 611-201. We have needed in the past, and still need, a new MOS group for the current infantry battle group. In my opinion, we cannot afford to avoid correcting this glaring deficiency before undergoing our next major reorganization of infantry units.

In approaching a solution to the problem, I am aware of and appreciate the need for a rigid policy in authorizing only a minimum number of military occupational specialties. This authority must of necessity continue to be centralized at Department of the Army. Furthermore, I also realize the importance and aims of the personnel management system. We must maintain a vigorous and realistic pattern of progression within the various career fields. Yet, on the other hand, these policies and objectives must at all times be compatible with and be flexible enough to meet the rapidly changing and complex job requirements of the modern infantryman. Napoleon's saying about the baton in the knapsack is no longer valid when applied to the training and identification of the light- and heavy-weapons infantryman.

In applying the threefold objectives I mentioned, I find it impossible to recognize the difference. Without belittling the traditional and continuing importance of our military bandsmen, I ask: Are the skills of a woodwind instrumentalist so significant and distinct that they require nine separate specialties? Are infantry skills so unimportant that they must continue to remain compressed around four job titles? In their respective roles, aren't both users and operators of instruments?

LT. COL. BLACKBURN STEPHENS
Fort Benning, Ga.

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THE ARMY SECRETARIAT

The background of the men who take over responsible positions when a new administration comes to power is always of interest and so ARMY presents here brief sketches of the new Department of the Army Secretariat.

Mr. STAHR and Mr. AILES

SECRETARY OF THE ARMY

Mr. Elvis J. Stahr, Jr., 45, is a native of Kentucky; a graduate of the University of Kentucky, he was a Rhodes Scholar at Oxford for three years. An ROTC-trained Reserve officer, Mr. Stahr went on active duty in 1940 as a lieutenant of infantry. After language training at Yale University and training at Fort Benning he served overseas in North Africa and the C-B-I. He left the service as lieutenant colonel after the war but remained a member of the active reserve until 1958. During the Korean war he served Secretary of the Army Frank Pace as a special assistant for Reserve Affairs. He became President of West Virginia University on 1 February 1959, the position he held when nominated for Secretary of the Army by the President.

Mr. MORSE

Mr. SCHAUB

UNDER SECRETARY OF THE ARMY

Mr. Stephen Ailes, 49, is a Washington lawyer in the firm of Steptoe and Johnson. He is a native of West Virginia, and a graduate of Princeton who earned his law degree at West Virginia University. He has had no military service but had government experience in the Office of Price Administration during the Second World War and with the Director of the Office of Price Stabilization during part of the Korean conflict. The elimination of the office of Assistant Secretary for Manpower will place additional burdens on the Under Secretary.

ASSISTANT SECRETARY OF THE ARMY (Research and Development)

Mr. Richard S. Morse, 49, who had been Director of Research and Development since 1 June 1959, continues in the same office but with a new title. He will have greater responsibilities in formulating and giving direction to the large sums the Army invests annually in research and development. Mr. Morse is a native of Massachusetts.

ASSISTANT SECRETARY OF THE ARMY (Financial Management)

Mr. William F. Schaub, 61, last year received the National Civil Service League Award for outstanding service as a career federal government employee. He entered the government in 1941 and since 1952 has been Chief of the Military Division, Bureau of the Budget. A native of Ohio, he is a graduate of the Wharton School of Commerce of the University of Pennsylvania.

ASSISTANT SECRETARY OF THE ARMY (Logistics)

This post was unfilled at press closing.

USAREUR DAMS DOLLARS

Operation PRIDE (Program for the Reduction of Individual Dollar Expenditures) has kicked off to a good start in the U. S. Army, Europe, where soldiers, from gen-

(Continued on page 16)

BELL ADDS 11 MORE WORLD RECORDS

Bell Helicopter team now claims 19 world records . . . takes lead from Russian MIL team!

THE 11 NEW RECORDS*

1. **Speed Run, 100 kilometers (62.14 miles)**
   Current record—101.14 mph—held by Russian KA-15
   Bell 47J-2 record claim: 107.08 mph (Class E. 1. c)
2. **Speed Run, 100 kilometers (62.14 miles)**
   Current record—70.36 mph—held by Czechoslovakian H.C.2
   Bell 47J-2 record claim: 104.61 mph (Class E.1.b.)
3. **Distance in closed circuit**
   Current record—None
   Bell 47G record claim: 631.436 miles (Class E.1.b.)
4. **Speed Run, 500 kilometers (310.70 miles)**
   Current record—None
   Bell 47G record claim: 73.985 mph (Class E.1.b.)
5. **Speed Run, 1,000 kilometers (621.40 miles)**
   Current record—None
   Bell 47G record claim: 73.641 mph (Class E.1.b.)
6. **Non-stop distance, straight line (Without Payload)**
   Current record—None
   Bell 47G record claim: 729 miles (Class E.1.b.)
7. **Speed Run, predetermined point-to-point**
   Current record—None
   Bell 47G record claim: 102.392 mph (Class E.1.)
8. **Speed Run, predetermined point-to-point**
   Current record—None
   Bell 47G record claim: 102.392 mph (Class E.1.b.)
9. **Altitude without payload—Female**
   Current record—14,760 feet—held by Russian Mil-1
   Bell 47G-3 record claim: 19,406 feet (Class E)
10. **Non-stop distance, straight line (Without Payload)—Female**
    Current record: 214.129 miles—held by Russian Mil-1
    Bell 47G-3 record claim: 404.36 miles (Class E)
11. **Speed Run, predetermined point-to-point—Female**
    Current record—None
    Bell 47G-3 record claim: 91.26 mph (Class E)

Of the other eight world records held or claimed by Bell helicopters, seven were set by the HU-1 Iroquois in 1960, one by the 47D-1 in 1952.

*Pending official verification by the Federation Aeronautique Internationale.

MISSION BELL ACCOMPLISHED

Today, Bell claims 19 official world records, more than double the number held by all other U. S. makes combined, and more than any other nation. Eighteen of these marks were set during the past nine months! And, each Bell record was established, not by an experimental ship, but by a *production-line* model . . HU-1 and Model 47 (H-13) series . . military and commercial products of the aggressive Bell engineering-manufacturing-management team. These accomplishments are a measure of the high performance standards by which Bell is known to military and commercial users . . evidence of Bell's undeniably superior capability to meet the helicopter performance demands of modern military planning.

For recognized world leadership in flight performance, look to

BELL HELICOPTER COMPANY FORT WORTH, TEXAS

A DIVISION OF BELL AEROSPACE CORPORATION • A textron COMPANY

eral to private, are taking steps to "dam the dollar drain."

USAREUR, always strong on the soldier's deposit savings program, is putting added emphasis on this type saving for enlisted men and encouraging officers and civilians, who are ineligible to use soldier's deposits, to sock their savings into bonds.

At the same time, Army authorities in Europe have outlined several other ways in which Americans overseas can help stem the dollar outgo. "Buying American whenever possible is a good policy," they say. "Post exchanges will be stocking more and more American items."

The time-honored mail order catalog is plugged and PX's will continue to help customers place orders direct to department and other stores in all parts of the U.S.

Soldiers are urged to patronize U. S. snack bars, clubs, messes and American-run recreation areas such as Garmisch-Berchtesgaden in Germany and Lake Garda in Italy.

"Buddy up" on trips, the Army urges, noting that those driving automobiles will be using American gasoline.

"If you're thinking of buying an automobile," said a USAREUR fact sheet, "just remember: your own country makes good ones." And it added, "None of this involves any real sacrifice on our part—just a little reflection on what is in the best interest of our country, and our interest too, for what hurts the value of the dollar also hurts us."

"Have another piece, Lieutenant?" suggests Mess Sgt. Harry Kasprzak at Redstone Arsenal

SPECIAL FORCES EXPANSION

Recognizing the need for heavier emphasis on unconventional warfare, the Army has moved to step up the training and manpower of its Special Forces. It plans to train 500 more selected men at its Special Forces Center, Ft. Bragg, N. C.

The Army has three Special Forces groups, one each stationed in Germany, Okinawa, and Fort Bragg. The latter post is the focal point of Special Forces training for the active Army, Reserve components and allied nations. Three courses are offered: Psychological Warfare, Special Forces Operations, and Counter-Guerrilla Operations.

In expanding Special Forces, the Army noted that the move was to create a weapon with which to aid the legal governments of its allies against the "criminal pressures which insurgent elements are bringing against them." To this end the Special Forces are an elite corps comprised of soldiers who are parachute and language qualified and have had cross-training in basic and specialized skills.

Organized into small multiple-purpose detachments, Special Forces soldiers are able to go into a strife-torn country and organize, train and direct native forces in defense against and defeat of insurgents. The basic operating unit is squad-sized and all members are specialists in weapons, demolitions, basic medical skills, intelligence and communications. Military coordination and strategic directions are under the Joint Chiefs of Staff.

Sgt. GOLDEN R. SMITH, winner of Match Trophy at Infantry School's annual rifle and pistol championship

COMBINED STAFF SLOTS

The Army says that the number, size, and complexity of unified and combined headquarters have so multiplied that there is an increasing demand upon them for senior experienced officers for this type of duty.

Army representation on such staffs leavens Department of Defense and unified commands with the views of men trained in the planning and conduct of ground warfare. "Their presence," say

(Continued on page 84)

How science serves Defense at Westinghouse

WESTINGHOUSE IMAGING SYSTEM ENABLES PILOTS TO SEE HOSTILE GROUND TARGETS ON DARK NIGHTS

Installed in combat aircraft or missiles, the new Westinghouse low-light level imaging system clearly pictures tactical targets normally obscured on cloudy, moonless nights. The system is equally effective for target-viewing systems in tanks or submarines.

Military pilots can see moving ground targets and terrain features at night, instantly, with a new low-light level electronic imaging system being developed at Westinghouse.

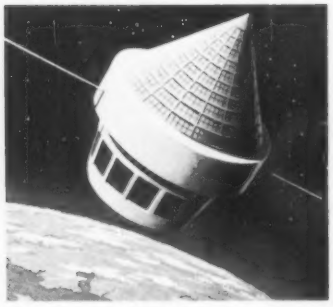
The new system will see hundreds of times better than the human eye under darkest night conditions. It is simple, compact, and rugged, utilizing advanced versions of the small Astracon light amplifying tube, a product of Westinghouse research. Systems using this tube will automatically track-while-scan, and simultaneously present a full field of view.

Westinghouse, at its Air Arm Division in Baltimore, is also applying results of its years of research in electronic imaging sensors to infrared and ultraviolet systems, planned for space programs.

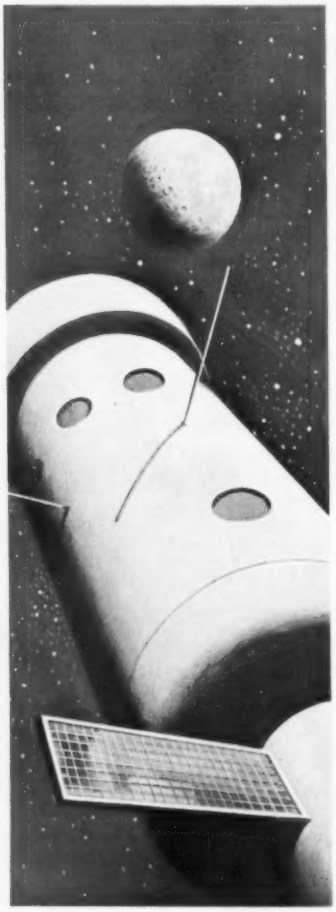
The new imaging systems, coupled with traditional Air Arm capabilities in fire control, reconnaissance, surveillance, and missile guidance, offer potent new levels of military strength for the free world . . . They are another demonstration of how science is serving Defense at

Westinghouse

Advanced Westinghouse thermal imaging systems for space applications permit accurate detection and tracking of ballistic missiles, satellites, or spaceships. These systems feature high scan speeds, high resolution, and inherent reliability. Low power consumption means weight and space savings.



Weather mapping the world is but one of the many jobs which can be performed with advanced Westinghouse infrared systems.



Westinghouse Uvicon ultraviolet imaging system will enable man to see a UV picture of the universe, taken from above the atmosphere.

Infrared, Ultraviolet imaging systems being developed for new space missions

Advanced imaging systems utilizing infrared and ultraviolet spectra are being developed at Westinghouse for a variety of military and scientific uses.

At the Air Arm Division in Baltimore, active and passive thermal imaging systems are being planned around advanced infrared devices, including the Westinghouse Space Thermicon. Missions include target detection, tracking and guidance, reconnaissance, surveillance, and mapping. A key factor in these systems is the successful application of ultrathin infrared-sensitive membranes developed by Westinghouse scientists.

Westinghouse has also developed the Uvicon imaging tube, sensitive to shortwave ultraviolet rays such as those emitted by celestial bodies but which are absorbed by our atmosphere. In space vehicles, systems using Uvicon will give man a new view of the universe.

These new IR and UV imaging systems, plus unparalleled advances in visible light systems, offer America potent new military and scientific capabilities. They are another demonstration of how science is serving Defense at

Westinghouse

SERVING
THE
UNITED NATIONS
IN THE CAUSE OF WORLD PEACE

THE STOL CARIBOU

DESIGNED AND BUILT BY

DE HAVILLAND AIRCRAFT OF CANADA

DOWNSVIEW MEMBER COMPANY of the HAWKER SIDDELEY GROUP ONTARIO

Washington Representative, J. E. McDonald, 319 Tower Building, 14th & K Streets, N. W.

Financial Management and the choice of weapons systems

The revolution in military technology since the end of World War II, or even since the end of the Korean War, has had a profound effect on the character of the military program. The great technical complexity of modern-day weapons, their lengthy period of development, their tremendous combat power and enormous cost have placed an extraordinary premium on the sound choice of major weapon systems. These choices have become, for the top management of the Defense Department, the key decisions around which much of the Defense program revolves.

Yet, it is precisely in this area that our present financial management system shows its greatest weakness. It does not facilitate the relating of costs to weapon systems, tasks, and missions. It does not disclose the full time-phased costs of proposed programs. And, it does not provide the data needed to assess properly the cost and effectiveness of alternative programs.

Admittedly, the financial management system must serve many other purposes. Certainly, it must produce a budget in a form acceptable to the Congress. It must account for funds in the same manner in which they are appropriated. It must provide to managers at all levels in the Defense establishment the financial information they need to do their particular jobs in an efficient and economical manner. It must produce the financial information required by other agencies of the Government—the Bureau of the Budget, the Treasury, and the General Accounting Office.

But all this is not enough. The financial management system must also be made to provide the data needed by top Defense management to make the really crucial decisions, particularly on the major forces and weapon systems needed to carry out the principal missions of the Defense establishment. These decisions cannot be made rationally without an adequate knowledge of the available alternatives, in terms of their military worth in relation to their cost.

CHARLES J. HITCH
Assistant Secretary of Defense (Comptroller)
1 March 1961

Is It So Unconventional?

Our publication last month of the first part of our condensation of Che Guevara's manual on guerrilla warfare *(the second part begins on page 59)* coincided with an announcement by the Department of the Army of a modest beef-up in the strength of its Special Forces. These two events resulted in a pleasing amount of mail directed to us on the subject of guerrilla operations. A few of our correspondents were interested in what the Cuban Communist had to say; others in what the U. S. Army is doing about guerrilla warfare.

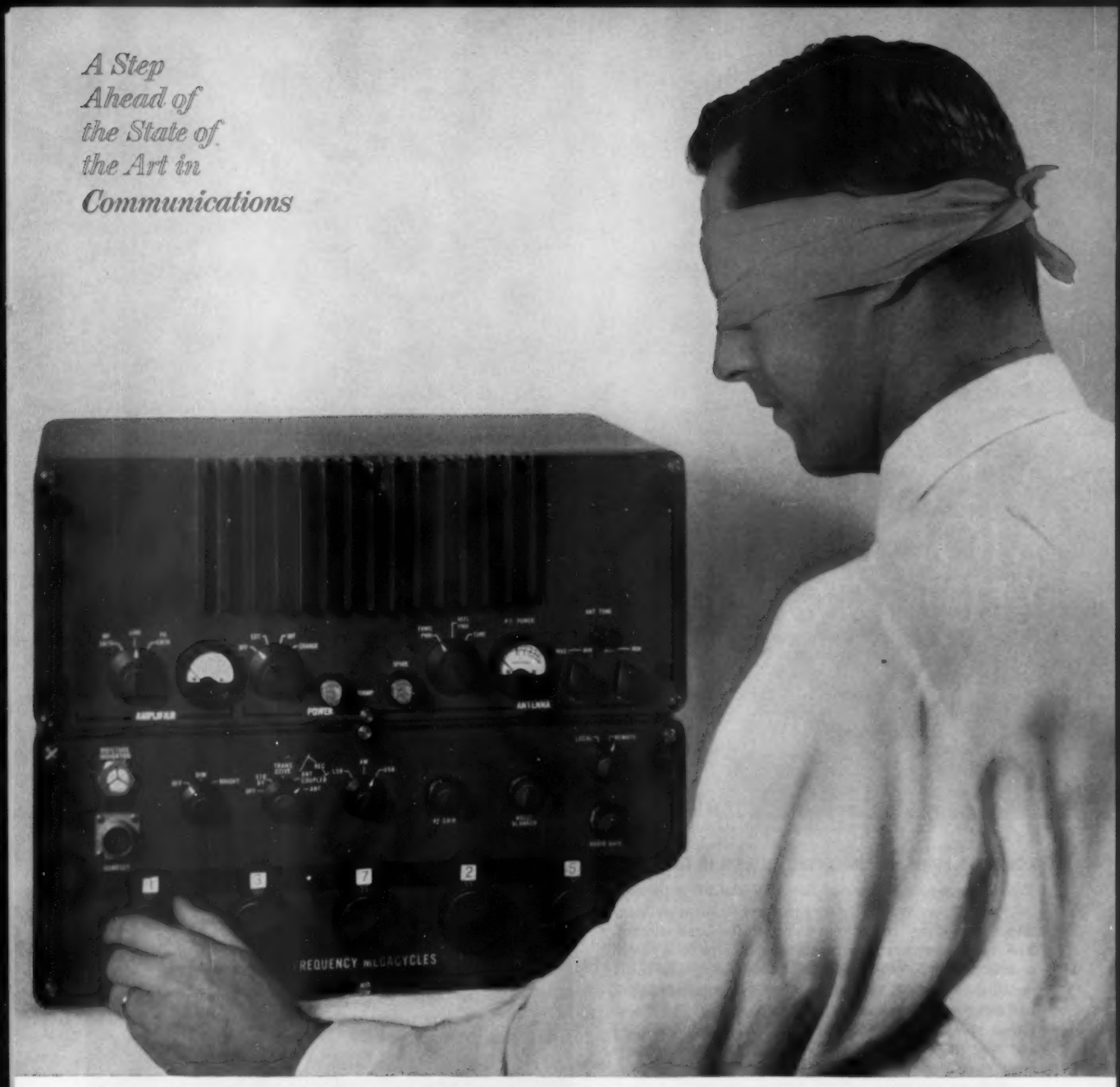
All of this suggests more than a passing interest in guerrilla operations, or what the Army euphemistically calls "unconventional operations." In many parts of the world, guerrilla operations are "conventional" and the warfare in Europe in 1914-1918 and 1939-1945 most unconventional. And certainly a war of thermonuclear exchange would be most unconventional, too. We would like to see "unconventional" dropped and if "guerrilla operations" isn't all-inclusive enough, perhaps some of our readers could come up with a good name.

Also coincident with our publication of "Guerra de Guerrillas" was the news in the press that the Communist Pathet Lao forces had been transformed from guerrilla bands into an "unconventional" army. This occasioned some surprise. It shouldn't have, for it has been a standard Communist practice for many years. Che Guevara stated the principle in this sentence which we published: "It is important to remember that guerrilla fighting is only a beginning or preparation for conventional warfare." And in a footnote on the same page we quoted from Mao's standard work that guerrilla units "change gradually into regular armies; . . . guerrilla warfare will develop into mobile warfare."

The lesson is clear. To Communists, a guerrilla force is the advance echelon of what is to become a fully-armed field army. The guerrilla force will divide like an amoeba and expand. Then their outside supporters—the Soviet Union, Red China or one of the larger satellites—will begin to move in the artillery, armor and other heavy gear a field army needs.

Obviously, guerrilla bands should be nipped before they grow too big. But unfortunately, the identification of such movements is difficult in their early stages, especially since the government against which the guerrillas are fighting is usually inclined to dismiss the trouble-makers as a local irritant of minor importance. But if the nature of the guerrilla force is identified early and energetic steps are taken to build a backfire of counter-activity, the movement may be stillborn. For, if we do not mistake their nature, guerrillas must expand or die.—J.B.S.

A Step Ahead of the State of the Art in Communications



How to lock on 28,000 frequencies—*blindfolded*

The General Dynamics/Electronics S-C 901 single sideband transceiver speaks with all the authority and range of 100 watts, yet measures only 14" x 17" x 17" overall, weighs a trim 70 pounds. All in all, a compact, rugged, easy-to-operate and highly reliable unit.

Digital tuning gives you fast, precise selection of any one of 28,000 frequencies—from 2 to 30 megacycles—and locks on. Frequencies have a stability of one part in 10^7 per week. Highly transistorized, the unit draws less than half the power of comparable AM equipment; and where tubes are used, a unique heat-sink design eliminates forced air cooling.

General Dynamics/Electronics digitally tuned SSB equipment can be used with a 1 KW power amplifier now under development in our laboratories. It's one result of General Dynamics/Electronics communications development programs for all branches of the armed forces. If you're interested in the S-C 901 or other advanced communications—write for specifications.

Engineers and scientists interested in challenging opportunities are invited to send résumés to Manager, Engineering Employment.

GENERAL DYNAMICS | ELECTRONICS
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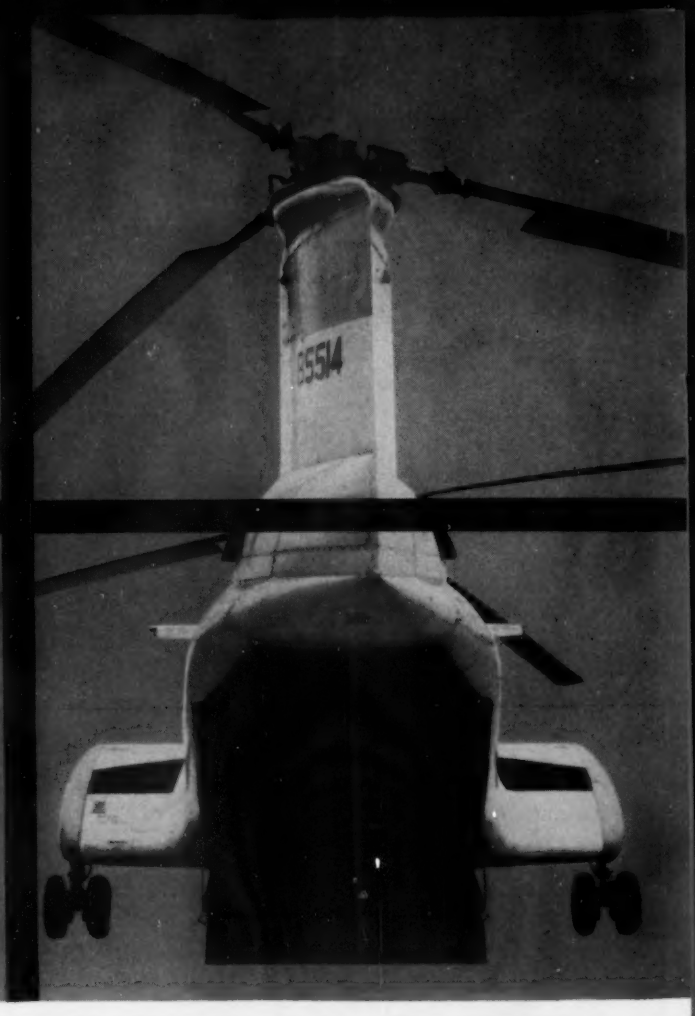
BOEING-VERTOL 107...

THE WORLD'S ONLY "MISSION MODULE" HELICOPTER

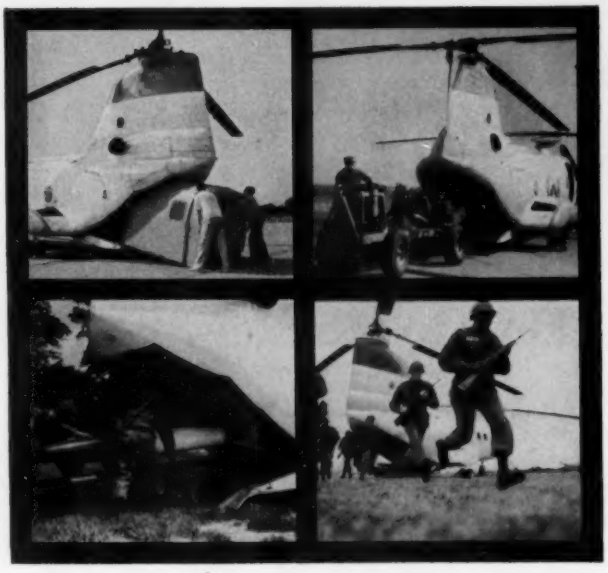


CONVERTS FROM MINESWEEPING TO ASW IN ONE HOUR

The new twin turbine-powered Boeing-Vertol 107 is the only helicopter flying today that can perform so many military missions—without costly conversion of the basic aircraft. The rear loading ramp and unobstructed cargo area permit a variety of modules or equipment to be quickly and easily installed on the 107, thereby enabling it to perform specialized missions for any and all military services. The Navy, for example, can use the Boeing-Vertol 107 for minesweeping and fleet utility duties and then, less than sixty minutes after mission completion, convert to anti-submarine warfare—simply by installing Vertol's ASW module.

Whatever the mission, the performance-proved Boeing-Vertol 107 offers features unmatched by any other helicopter—150 mile-an-hour cruise speed... neutral directional stability at zero airspeed for any-wind hovering... a Vertol-developed stability augmentation system (SAS) provides fixed-wing aircraft stability which can be augmented with a trim system for automatic flight... tandem-rotor design that minimizes down-wash velocities... ability to land and take-off from water without special flotation gear.

These are just a few of the capabilities that make the Boeing-Vertol 107 the *first* all-mission, all-service helicopter.



VERTOL DIVISION
MORTON PENNSYLVANIA
BOEING

IF THE DETERRENT FAILS

The absence of conventional arms contributes to the terror and instability of today's world

ARTHUR T. HADLEY

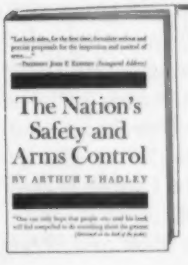
THROUGH VULNERABILITY, American strategic weapons may fail to deter an all-out nuclear strike against the United States. But the deterrent can fail in another fashion. For the United States relies on the nuclear deterrent not only to prevent an all-out strike against America, but also to contain a less than major emergency: an invasion of Iran, of Formosa, a Communist takeover in Egypt, or the fall of Berlin. These are the areas in which failure of the deterrent appears most likely. This article outlines some ways in which such failure may come about and what the results would be.

The present United States policy of deterring all forms of aggression by threat of nuclear strike was succinctly stated in September 1960 by the retiring Chairman of the Joint Chiefs of Staff, General Nathan F. Twining of the Air Force. Said Twining: "The American capability for decisive, war-winning response to any attack must be kept sure whatever the costs. It is the only reliable guarantee of the peace. Forces that cannot win will not deter." On the surface this statement may seem reasonable. But in the kilomegaton world where the Soviet Union can decisively strike the United States, a man has to define what he means by winning.

Just what would happen if the Soviets made certain moves around the periphery of the Communist world has been the subject of intensive study in Congress, the State Department, the Pentagon, and in some academic circles. Usually these studies take the form of "war games." In war games certain hypothetical situations are established and two teams set up. One team plays the United States, another in a different room plays the Soviet Union. In between are the umpires who decide on the results arising from the various military, political, and diplomatic moves made by the opposing teams. War games, if well played, have the advantage of forcing people to think about unpleasant alternatives. Their disadvantage lies in the word "game." Reality can sometimes vanish to a far remove.

In addition to exploring the results of Communist attempts to nibble at the periphery of the Free World, war games have also faced the possibility of nuclear accident. While the breakdown of deterrence from nuclear accident is less likely than from Communist pressure, the chance of accident is high enough to merit study. In particular there is always the fear that tension resulting from Communist pressure and an accident will combine to produce an extremely critical situation.

As a typical war game example: during the alarms produced by a Chinese Communist diplomatic offensive against Formosa, three United States bombers return to their base in Okinawa after a routine practice alert. Just before landing the tail plane has a flame-out and crashes. In the crash, through electronic failure, a thermonuclear



This article is drawn from Chapters 3 and 5 of *The Nation's Safety and Arms Control*, a book by Arthur T. Hadley, published on 29 March by The Viking Press. It is an important book; one that shows a hard but hopeful way to security without surrender . . . of the possibilities of salvation from the terror of Doomsday Machines, in being or threatening. And best of all, it is readable, blessedly free of the cant of the war-game shill. Every soldier ought to read it.—J. B. S.

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bomb fires. A two-megaton explosion occurs, completely taking out the Okinawa base.

This is the easiest type of situation to cope with as it occurs on a United States base and not over hostile territory. But even here there are major problems. What do the pilots at the ready on the other base in Okinawa do when they see the nuclear cloud start to rise? Wait or take off for their targets? Their problem is complicated further because radio communication is apt to be marginal in the confusion following a nuclear explosion. The bomb alarm goes off at the Strategic Air Command headquarters in Omaha, Nebraska. A nuclear explosion has occurred on Okinawa. What does the duty officer do? Are the Russians about to attack and has one of their missiles fired early? Has one fanatic Red Chinese decided to try and trigger World War Three? Is this a trick to get most of SAC into the air? For if most of SAC goes into the air at once, they must all come down at about the same time, and then for about twenty-four hours while the planes refit and refuel they will be exceptionally vulnerable. Or is it an accident?

As a result of war games in which just such theoretical accidents were staged, changes have been made in United States nuclear weapons so that the duty officer's problem is easier now than it was some years ago. The jet reconnaissance plane dispatched to the Okinawa area will be able to report by analyzing the radioactivity that the explosion was caused by a United States bomb. There would also be a possibility that Soviet intelligence had learned how we mark our weapons, but that is highly unlikely. In any event the military commanders will know after about an hour that the odds are overwhelmingly in favor of the Okinawa nuclear explosion's having been an accident.

Then how does the United States convince the Soviets, first, that United States officers realize it was an accident and, second, that it wasn't a fake accident staged by the United States to provide an excuse to strike? And if there was such an explosion in Russia, how do the Soviets convince the United States it was an accident? These sorts of problems are best solved by an arms control agreement already in force that outlines methods of reassurance under such circumstances.

More likely than mechanical failure is human failure. Commanders, particularly under pressure in times of crisis, do not always follow orders. In 1958 twenty-five French planes bombed the town of Sakiet-Sidi Youssef in neutral Tunisia near the Algerian border. At the time the French government took full responsibility for the attack. A week later the French Foreign Minister admitted that the French government, including the Minister-Resident for Algeria had not known the attack would take place. The local air force commander had decided to make the raid on his own because reportedly the Algerian rebels were using the town as a base from which to infiltrate into Algeria. What happens if some Soviet or Soviet satellite commander takes such an action, with or without nuclear weapons?

Or, broadening the war game scenario, suppose the definite possibility of a Communist uprising in Iran comes to pass. The Shah and a few loyal commanders fight on in the south and appeal to the United States for aid. The United States, recognizing that if Iran goes Communist the entire Middle East will soon follow, and bound by her commitment under the 1959 bilateral defense treaty, scrapes together all the airlift it has at present and flies in two United States infantry regiments from Germany. The Soviet responds by moving three divisions of Kurdish volunteers across the border under the free Kurds' leader, Mullah Mustafa Barzani, who is also a major general in the Soviet Army.

Realizing that they are outnumbered and will be pushed out of Iran before more help arrives, the United States troops block the free Kurdish advance through the mountains of northern Iran with 5-kiloton nuclear weapons (one-fourth the power of the Nagasaki bomb). These are launched from the rockets carried with the two regiments. The Soviets strike back with their mid-range rockets, firing them from outside Iran at the United States regiments, particularly their rocket batteries. Investigation puts the Soviet nuclear explosions in the thirty-kiloton range.

The United States troops are badly hurt, and to save them a carrier strike is launched against the Soviet rocket bases in Soviet Armenia with 100-kiloton weapons. In response, Soviet bombers strike at the carriers with weapons in the megaton range. This is known as the process of escalation, a small war getting bigger and bigger. The question is, how far does the escalation go? How long does the deterrent hold off strategic, all-out war? Who backs down? What should have been done?

All-out nuclear war

The preceding sketchy scenarios have been taken up to the point of what happens then? But to explore the question of what is meant by winning, one situation should be pursued to its theoretical end under present United States policies and capabilities. One of the most probable and dangerous locations for trouble is Berlin. Let us assume that the Soviets gamble the United States is not willing to fight for Berlin and, using Russian troops, seal off the border between East and West

Germany and seize Berlin. The deterrent has failed. Berlin is Russian.

Following its current strategy, the United States realizes that with its neglected conventional forces it cannot dislodge the Soviets from Berlin. United States diplomats warn that if Berlin continues in Russian hands, Western Europe is lost. Each side begins pressuring the other to back down. Finally the United States makes the response it has spent its money preparing for and launches a strategic nuclear strike against the Soviet Union. The exact amount of nuclear explosive the Strategic and Tactical Air Commands combined can lift against the Soviet Union in a twenty-four-hour period is a closely held secret. But 18 to 20 kilomegatons is an estimate that under average conditions is not too far off.

There is no doubt, after the United States delivers an 18- to 20-kilomegaton attack, the Soviets have lost. Between 85 and 90 per cent of their population become casualties in the first sixty days. Their major cities and seven-eighths of their industry are gone. Their leaders have miscalculated the effects of seizing Berlin.

The Soviet satellites also take heavy casualties; just how heavy is open to question, since the majority of these casualties would result from long-term fallout, which would vary in intensity with weather conditions. However, the probability is that, one day out of three, 50 per cent of the population in areas as far away as Great Britain receive a lethal dose of radiation from the United States attack on the Soviet Union. The satellites, being closer to the Soviet Union, and countries to the south, such as Burma and India, which are downwind under most weather conditions, have significantly higher casualty rates.

This destruction of the Soviet Union would not be quite as great as that visited on Carthage by Rome. The Romans killed every Carthaginian adult male, sold the women and children to slavery, burnt the city, plowed the ashes under, and sowed salt in the furrows. But it would come close, or be of the same order of magnitude, to use the the language of our time.

The Soviets would have lost. But has America won? In war games it is often assumed that the Soviets could deliver, as a second-strike capability against the United States, a 2.5-kilomegaton attack. Many feel this is a conservative figure. With each hundred 10-megaton missiles the Soviets produce they add another kilomegaton to their capability. The actual weight of an attack in the mid-sixties can perhaps best be calculated at 5 kilomegatons.

The Soviets can deliver such a large attack because it takes about one-half hour to ready a Soviet missile for firing. The Soviet radar stations along the Russian border and in the Arctic, plus the picket ships in the Atlantic, will pick up the bombers of SAC about 250 miles out. This gives the Soviets more than ample time to ready and fire their missiles. These missiles, in addition to being targeted against the SAC bases, United States atomic plants, and some major cities, also would probably take out portions of the United States Air Defense. Through these Air Defense holes those Soviet bombers which got off the ground would fly to attack their United States targets.

A 5-kilomegaton attack against the United States in the present state of civil defense preparation will kill about 140 million people, between 75 and 80 per cent of America's population, in the first sixty days. A lesser amount of nuclear explosive does much greater damage to the United States than to the Soviet Union because of America's geography, urbanization, and weather pattern. The number of dead will continue to rise over a further period as long-term fallout, epidemics, lack of shelter, food, and medical supplies all take their toll.

There is always a great deal of dispute as to how many people are killed by fallout. The immediate blast and radiation effects, short-term gamma deaths, are easy to measure. But long-term fallout so depends on the material in the nuclear bombs, the height at which they are exploded, and weather conditions on the day that any figure is open to argument. The lethal dose, or LD, of radiation depends not only on the intensity of the radiation but on how rapidly the individual absorbs the radiation and for how long. The lethal dose or LD is expressed like this: 30/LD/50. If this particular ratio applied to the reader it would mean there would be a 50 per cent chance he wouldn't be around at the end of thirty days.

With luck and some more civil defense protection than now, 60 million Americans might well survive a 5-kilomegaton attack, be able to grow food in non-contaminated areas, and bear children. A few of the children would be stillborn, perhaps as high as 8 per cent. One never knows quite how to present such figures as these. Facts are usually best presented dispassionately. Yet when such facts as these are presented dispassionately one is accused of being everything from a paranoid to a militarist.

In addition to the numbers of people left, there is the whole question of what sort of world the survivors would face. Here the experts disagree. Some, pointing to the fact that Norway and Finland survive successfully on populations of around 7½ million, see successful patterns of civilization

being re-established within a generation or two. Others believe the environment in the shattered radioactive world would be far more hostile. Civil defense measures certainly make a difference, but unfortunately there are also countermeasures to civil defense. Many who study the problem most oscillate in their views of what the post-attack world would look like.

Perhaps the best comment to make on the post-attack world is to look at one of the problems of that environment being seriously considered by Air Force scientists. Most post-attack problems seem unbelievably macabre by pre-nuclear-attack standards. This particular problem concerns the minimum age at which Americans will be forced to eat heavily contaminated food from radioactive farm areas. The least contaminated food is obviously restricted for children and nursing and expectant mothers; the next best for the people who can work hard. But there is not going to be enough of either of these two types to go around. Someone is going to have to eat the less desirable food. Probably the best age to start issuing ration stamps that entitle the consumer only to contaminated food is forty. After forty there isn't much calcium deposit in the bones, so that the danger of bone cancer is lessened. At any rate, bone cancer takes twenty years to form and in the post-attack world it is questionable how many survivors will live past sixty.

With 80 per cent of America's population dead and the survivors facing such problems, has America won this particular operation?

There are some definite replies to that rhetorical question. America hasn't lost. If the survivors, on picking their way out of the radioactive areas, had found themselves slaves to an only partially damaged Soviet Union or Red China, they would have lost. In the kilomegaton world it becomes more difficult to win, but it is still easy to lose. Nor has this attack come close to the Death of Earth, that moment when mankind pushes the extermination button. To approach one-eighth of the way to the DOE requires at least the almost simultaneous detonation of the entire United States and Soviet stockpiles, some 55 kilomegatons. In the exchange just considered, only 23 kilomegatons were used. Both sides used less than half their present stockpiles of nuclear explosive. It is such results as this that cause the experts to question whether either side will ever fire anything approaching close to all their weapons at each other.

Because of the extreme difficulty in predicting the long-term effects of fallout, there is no agreement on where the Death of Earth occurs. Ten thousand kilomegatons is a figure often used. But its accuracy is open to question. Trying to kill all life by nuclear radiation is like trying to put out a raging fire with water. A few bucketfuls of water undoubtedly dampen a few embers but one cannot see much difference. A few tons of water bring the fire under control. But to extinguish the last ember deep in the smoking ruins requires many extra tons more. This metaphor is at best only moderately consoling.

Is there a U. S. Nuclear War Policy?

These ultimate results of what logically follows if the nuclear threat fails to deter the Soviets from annexing Berlin have not been presented to argue that America abandon either Berlin or its strategic weapons. Berlin is part of the Free World and the key to Europe. United States strategic nuclear weapons are necessary to deter a nuclear attack against either America or its allies. But the results of the failure of nuclear retaliation to defend Berlin are important in deciding whether Berlin is best defended by threat of nuclear retaliation. Or is American security and the prevention of nuclear war best assured by meeting less than major aggressions, such as Berlin, by conventional forces equipped with high explosive?

As late as October of 1960 the United States Air Force and the Bureau of the Budget were in effect urging that the United States meet all threats by relying on the strategic nuclear threat. Both then argued in favor of further reduction of the United States conventional arms and soldiers in Europe and total reliance instead on air-delivered nuclear strikes. Their argument was the old one that it made no sense from "a purely military point of view" to plan to use anything but the most powerful weapons that America possessed. The implication was plain that any other point of view was politics and not worth much.

Probably arguing from " a purely military point of view" never made sense. Clausewitz, who wrote that much quoted but largely unread military bible, did not think it did. Certainly in the nuclear era, when the nuclear front is everywhere, when the entire population is in the front lines, there is no longer a purely military point of view.

Nuclear weapons can now devastate America. And the destruction or survival of America is a political decision. There is therefore no difference between political and military goals. What makes sense from a purely military point of view, such as relying on nuclear weapons and reducing United States ground forces in Europe, has come to make no sense, period.

After looking at what will happen in a major nuclear exchange, the question arises: Does

America really plan to use its nuclear arms if the deterrent fails to halt some Communist aggression short of an all-out attack? This is what the United States has said publicly that it will do. This is what the United States plans and weapons are designed to do. This is what America has spent its money on. The belief that America will do so helps hold the Soviets in check. But is it what the United States actually will do if forced to act by the fall of Berlin or the invasion of Formosa? Or can Khrushchev possibly mean it when he says he will defend the Castro regime in Cuba by firing missiles against us? Both sides at certain times put their hands over their hearts publicly and swear they will answer minor violations of the peace with nuclear strikes, but will they?

There are definite physical signs that indicate America won't. If the United States is seriously preparing to launch this sort of attack if provoked, then the United States must logically also be preparing to receive a surprise strategic nuclear attack. For if the Soviets are convinced that they will be attacked with nuclear weapons if they attack anywhere on the periphery like Berlin or Iran then before they attack on the periphery they will first try to destroy the United States. Only in that way can they attack the periphery with relative safety.

If America were really prepared to launch a strategic nuclear strike to defend all parts of the Free World, it must have occurred to America's leaders that, if the Soviet believed us, the chances of their launching a surprise attack against us were quite high. America has said it would never strike first. America has declared the Free World's periphery would be defended with nuclear weapons. Yet America has not prepared to fight the type of strategic, nuclear war that must logically result from these two statements.

It is not only United States strategic weapons themselves that are unprepared for surprise attack; the command channels to control them are not designed to function in a nuclear war. The Joint Chiefs of Staff war room in the basement of the Pentagon, from which the war would be directed, is only protected to about 10 pounds overpressure from blast (10 psi). This makes it little better than an ordinary home bomb shelter. Not only is it vulnerable to a Russian missile bursting five miles away, but one of the major storm sewers of Washington runs close to the war room. In the event of a nuclear attack the chances are good that this sewer would fracture, flooding the JCS war room. This is hardly the command post a nation that must expect a surprise attack would prepare.

Tunneled into the sides of a mountain, another "secret" hideaway has been prepared for the Joint Chiefs and the President outside of Camp Ritchie, Maryland. Signs point to it so you cannot miss it in an emergency. Plans have been made to airlift the senior members of the Joint Chiefs and the President there by helicopter, taking about two hours. The more junior members with the vital war plans, code books, and combinations to the safes, make their own way there by car. The average flight time of a Soviet ICBM from firing to target is twenty-five minutes.

There are other revealing lapses, conscious and unconscious, in America's preparations to fight the war it claims it is prepared for. The nation is "protected" against attack from Russian bombers by a vast electronic system of interconnecting anti-aircraft stations stretching from coast to coast called SAGE (semi-automatic ground environment). The vital parts of this system are not protected against blast in any way. A good hurricane will knock them out. This system, meant to detect and destroy Russian bombers, was not designed to and cannot perform after the system itself has been under nuclear missile attack.

The Strategic Air Command contracts for expensive computers to help them fight the war and then places them in underground shelters which are completely vulnerable to Soviet missiles. The civil defense program and the anti-missile defense program, two vital projects if America were actually going to rely on a strategy that makes surprise nuclear attack against the United States likely, dawdle along with little military, Congressional, or public support.

So the question returns: Will America actually respond to less than major Soviet aggressions with an all-out nuclear strike or with actions that make escalation to all-out nuclear war likely? And if the answer is yes, in view of the disaster to the country—though the disaster for the USSR might be far worse—does the United States want to continue to plan to defend the periphery this way?

At the present time there is nothing much else America can do. The twenty-one NATO divisions in Europe, including five United States divisions, cannot cope with a Soviet thrust at Berlin. They cannot respond to another Hungary, if they should want to. The three divisions in strategic reserve in America, though crack divisions, lack the airlift necessary to move them.

At the same time, a great many brave men, from Norway through Iran to Indochina, have staked their lives on United States obligations to defend the periphery. These are obligations that must be honored even at the cost of over 80 per cent casualties to the United States. But while America prepares to stand by its commitments, it might look for ways of honoring them short of

mutual catastrophe. To build the ability to do this may seem like a purely military measure, but it is legitimately part of arms control, for it greatly reduces the threat of general nuclear war. And this is a primary objective of any arms control plan.

The problems and possibilities of building a non-nuclear answer to meet limited Communist aggressions [as an early move towards arms control is dealt with in the final section of this article]. Here it is important to look at some of the alternate plans currently proposed to escape the necessity of meeting every Communist challenge with threats of an all-out nuclear strike. For these proposals form part of the philosophy of United States defense today. These plans recognize the devastating nature of an all-out nuclear exchange but try to limit the exchange rather than find other methods of dealing with the aggression. The plans have about them a surface air of unreality which on closer examination seems to permeate their entire being. But they are being advanced seriously and so should be looked at.

Basically, all these plans are based on careful selection of the targets to be attacked (limitations of targeting doctrine), or the weapons to be used, or both. In the most general form the nuclear attack on one country by another is restricted to strategic military objectives, airfields, missile sites, atomic plants. Since both Russia and America are moving to protect these targets by hardening, digging them into the ground and/or putting concrete around them, these military targets will have to be attacked by ground-burst nuclear weapons to be effectively destroyed. An attack in this fashion maximizes the amount of fallout, since debris is sucked up into the thermonuclear cloud to be deposited later.

For the United States the present difference in casualties between a 5-kilomegaton attack directed just against military targets and one of the same size directed against military targets plus cities is roughly 25 per cent without civil defense, or 90 million killed instead of 140 million killed. It is no small thing to save 50 million people; but for the nation as a whole, how significant is this targeting doctrine?

Also at the present time the Soviet Union could not possibly afford to make even this slight distinction in targeting the United States. For, as previously mentioned, the United States plans to offset the extreme vulnerability of its bombers on the ground by taking many of them off their military airfields and dispersing them to the municipal airports located at the edges of America's major cities. The cities are thus military targets. Also many of the new hardened missile bases are being placed upwind from major United States cities. These are the targets that must be attacked by ground-burst thermonuclear missiles which produce the maximum fallout. So once again the population of the cities cannot escape through some targeting limitations.

The most "sophisticated" form of the nuclear target selection is the intercity exchange. Under this concept, if the Soviets attacked Berlin the United States would announce that they were going to knock out one Soviet city, say Rostov on the Don, to show they mean business about protecting Berlin. After the Soviets had time to evacuate the city it would be destroyed. The Soviets would come back and knock out a United States city of the same size, say Buffalo. Both sides would keep trading cities one at a time until either American or Soviets cried enough and backed down.

Fortunately or unfortunately, the world does not run in such a rational fashion outside of universities or war games. In this irrational world, the possibility that either Russia or the United States will answer the first limited nuclear strike with everything they have will always be great enough to block use of such target selection systems.

Another doctrine proposed to avoid the consequences of an all-out nuclear exchange has been that of the blunting attack. This is the doctrine of pre-emptive war, that twin sister of preventive war who has changed her name as an aid to public acceptance of her nefarious business. There are two important comments to make about pre-emptive war. First, it won't work. It will not work because in the missile age, unless one side falls gravely behind, both sides will always be able to launch enough of their missiles to heavily damage the enemy even if attacked first. Second, the mere indication that pre-emption might be United States doctrine increases the temptation of the Soviets to pre-empt the pre-emption. If America and the Soviets are both committed to the doctrine of pre-emptive war, then in any major crisis each will look for the other to pre-empt and strike first. This increase in mutual trigger-happiness makes the chance of an all-out nuclear war frighteningly greater.

To limit or control the nuclear strike is not the answer to dealing with aggressions short of all-out war. What is necessary is to create other methods of defending Berlin, Formosa, Iran. When this has been done, the danger that any less than major provocation may explode into an all-out nuclear war will have been greatly reduced. And since America will then no longer have to rely on nuclear terror to defend the periphery, that terror itself can start to be reduced without increasing the chances of a Russian grab at such spots as Berlin and therefore of all-out war.

Then all the strategic nuclear deterrent will

have to deter is major aggression by the Soviets or Red Chinese against America or its allies. The use of the United States nuclear strategic force to meet such an attack is logical. Therefore, America need no longer be bellicose about the deterrent. It is only when America must deter peripheral pinpricks with the nuclear strategic threat that the country must continually chant its willingness to use nuclear weapons and build up its nuclear stockpile as an earnest of its intent.

In today's military situation two facts produce the hyperinsecurity that makes limitations on arms presently impossible. There is the vulnerability of America's strategic deterrent, principally SAC, to surprise attack, and the dangers that flow from this vulnerability. There is also the reliance on nuclear war to solve practically all military problems.

As long as either of these two situations exists in extreme form, reduction of arms is close enough to impossible to be classified as impossible. For it is not only the presence of nuclear arms, but the absence of certain other types of forces that contributes to the terror and instability of today's world. That is why the arms controller finds himself in the paradoxical situation of advocating the build-up of certain types of arms as the first step toward arms limitation.

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Non-nuclear answers

Along with building a secure deterrent, America must find some method of protecting the non-Communist world other than the threat of nuclear war. This is a subject about which there has been a great deal of misunderstood shouting over the past few years. Two Army Chiefs of Staff, Generals Maxwell D. Taylor and Matthew B. Ridgway, on their retirement wrote bitter books opposing the reliance on nuclear answers to all questions. And this issue was also partly responsible for bringing about the premature retirement of the Army's most famous younger general, the brilliant James M. Gavin.

The dangers in the less-than-major-war problem have been discussed in the preceding pages. The solution is neither politically nor militarily simple. To fight non-nuclear small wars over such areas as Berlin, the United States not only has to modernize drastically the obsolescent Army and build the necessary airlift to move Army reserves, it also must draft more men. Political willingness to draft men in peacetime has never been high. And the whole program will be expensive: not nearly as expensive as losing a limited war and either taking the defeat or going to all-out nuclear war. But that cost is in the future, while the cost of avoiding it is part of the political present.

The problem is complicated by the argument whether the United States should plan to use small, tactical nuclear weapons in a limited war. Those who feel that the United States should, argue that only by using tactical nuclear weapons can the United States compensate for the military manpower advantage of the Communist bloc. The 60-odd Soviet divisions immediately available for use in Europe can only be blocked by NATO's 21⅓ divisions if tactical nuclears are used.

Why NATO should be limited to 21⅓ divisions or even 30, which is NATO's goal, for any reason but unwillingness to make sacrifices has never been made clear. By 1965 there will be 59 million males fit for military service in the Soviet bloc (excluding Red China). At the same time there will be 95.4 million fit males in the NATO alliance. This ratio, coupled with the Russian manpower crisis stemming from less efficient agriculture, would seem to leave the manpower balance decisively tipped in NATO's favor.

In addition there are various other factors that indicate it is to the United States' advantage to fight limited high-explosive rather than limited nuclear wars. The West places a higher value on human life than the East, and nuclear wars produce far more casualties than non-nuclear ones. The Free World is superior in industrial capacity to the Communist bloc, and it is in non-nuclear wars that industrial potential becomes a strategically decisive factor. Finally, there are complex battlefield considerations, particularly the applications of mobility and electronics, that indicate the West's advantage lies in high-explosive wars.

This is not to say that the United States should lack the ability to fight tactical nuclear war. As long as the Soviets have the capability to wage such a war, the United States must be prepared both to conduct and to withstand such a battle. However, United States priority should be placed on the better choice of waging a limited high-explosive war.

In addition to its being to the West's military advantage not to use tactical nuclear weapons, avoiding such weapons helps solve the problem of escalation: a large war growing out of a small one. The danger of escalation into strategic nuclear war appears to increase decisively as the amount of nuclear explosive available to both sides increases. When the tactical use of nuclear weapons, particularly of fractional kiloton weapons (weapons with the explosive power of around 100 tons of TNT), was first strongly advocated in the United States, the Soviets had little nuclear explosive. They would have been unable to answer in kind a tactical nuclear attack by the United States without seriously depleting their strategic stockpile. Nor did the Soviets have any reliable method of delivering their *(Continued on Page 86)*

NIFICATION

HOW MUCH MORE?

Col. WILLIAM E. DEPUY

THERE have been only two modes of life in the Pentagon: preparation for the next reorganization, and recovery from the last. As a practical matter these periods overlap and become one. Therefore, the views which follow are based on the assumption that the subject is very much alive. They spring from the further assumption that professional soldiers should set forth their views on these matters which recently have been largely monopolized by laymen. Only one aspect is examined here: the role of the services.

Some area of underbrush needs clearing before the basic issues can be approached. The last 15 years have seen a somewhat uneven progress toward what is loosely called "unification." There has been a steady accumulation of power around the person and the office of the Secretary of Defense. Recently, the strength and scope of the Joint Staff were also increased. There has been, consequently, a diminution in the autonomy and authority of the several services. It is clear, however, from reading the debates in the Congress, and the testimony of Government witnesses, that no one has a very clear idea of where this process is leading, or indeed should lead. The public debates have been mostly distinguished by their tendency to wander off in pursuit of catch-phrases of doubtful value or significance. For example, anything that even vaguely suggests the desirability of increasing the power of the Chairman of the Joint Chiefs of Staff—or worse, suggests the possibility of a "single Chief of Staff"—is immediately attacked by allusions to dangers of creating "a man on horseback." Oddly enough, this charge seems to carry some weight even though no one ever seriously suggests that such a plan would produce a Napoleon, or a Genghis Khan or a Charles XII.

Even the President, with his enormous and open-ended powers including that of Commander-in-Chief of all the armed forces, finds it impossible to mount his horse and ride roughshod over the Congress, the press or even the services. In fact, the checks and balances within the U. S. Government seem to be working better than the Founding Fathers ever imagined.

Another specter which appears whenever the size or powers of the Joint Staff are discussed is the fear of creating a "great General Staff." Those who brandish this forensic weapon never get down to cases or bother to distinguish between the great General Staff of Moltke, or Oberkommando der Wehrmacht (OKW) of World War II. Without spending too much time on this detour, we might recall that Moltke's system was a unique and still controversial relationship between commanders and their principal staff officers who (the staff officers, that is) maintained a special relationship with their brother general staff officers at higher and lower headquarters. It was certainly not this system which led to World War I, but rather, and typically in the case of Germany, the political overlords who misused the undoubted military talents of the German people. During World War II, OKW was crippled to some extent from the beginning by the personal interference of Hitler who appointed and relieved its chiefs on the basis of their compliance with his wishes and the degree to which they shared his delusions. Even crippled as it was, OKW and Army High Command (Oberkommando des Heeres, or OKH) prosecuted a long, bitter and nearly successful war on meager national resources against the overwhelming strength of the Allies and the Russians. Whatever else may be said about the German General Staff, it can hardly be charged with inefficiency. If it was wicked as well, it was the wickedness of Hitler and the failure of the German generals to restrain him. Ironically, it was the reluctance of the German General Staff to become involved in politics rather than the reverse which is the usual basis of their indictment.

More recently, discussions of "unification" have wrestled with a maxim which is said to have developed from the experience of World War II, to the effect that "separate land, sea and air warfare is a thing of the past." Obviously, the phrase has some substance. If, for example, it means that the infantryman cannot win wars alone—that is, without airplanes and so on—then who can quarrel? On the other hand, if it means that armies, navies, and air forces are outmoded, then there are people who would disagree—myself included. In any event, it is not so definitive a statement as to be very useful as a guide to future action.

In addition to the clichés which tend to sidetrack us, we should note some permanently operating factors. The Congress, charged as it is with the Constitutional responsibility of raising and maintaining armies and navies (some people amuse themselves by imagining that the USAF is unconstitutional), finds it difficult to keep up with the Executive branch. With its vast powers and resources, the Executive branch tends to overwhelm the Congress. As a consequence, the Congress finds it helpful to be able to call witnesses directly from the individual services as a means of keeping tabs on the Department of Defense and on the Administration's military plans and policies. For this reason, among others, the Congress tends to view further unification with suspicion and fear. Suspicion that too much power is being accumulated by the Executive as opposed to the Legislative branch, and fear that a curtain of silence would fall around a too highly centralized defense establishment and make it impossible for the Congress to be informed on those defense matters for which it is responsible under the Constitution.

The Administration (meaning the White House, the Bureau of the Budget, and the Department of Defense) has consistently favored a greater concentration of power in the Office of the Secretary of Defense. Part of this is institutional and reflects the growth of the already extensive office of the Secretary of Defense with its array of assistant secretaries, special offices and agencies. Surely much of it arises out of the painful process which the Administration must endure each year as it forces reluctant services to accept smaller budgets than they individually feel they can accept.

Because the services traditionally feel a responsibility toward the nation, the Congress and their own institutional consciences, and because the services have political constituencies in and out of the Congress, industrial supporters and publicity outlets, there is an outburst of so-called "interservice rivalry" each year at budget-cutting time, or whenever a service feels its vital interests are threatened. Quite naturally this phenomenon, which has an unruly look about it, is distasteful and painful to the Secretary of Defense. He tends to favor measures which reduce the autonomy of the services and their ability to outflank him through the press and the Congress.

In their individual attitudes toward "unification" the services themselves have followed a somewhat erratic course. At the end of World War II, the Army was the chief proponent of unification. The Air Force was concentrating upon its goal of "independence." After some initial hesitation, the Navy came out strongly for service autonomy and loose central direction by a weakly empowered Secretary of Defense.

The Navy remains largely opposed to any further increase in the power of the Secretary of Defense at the expense of the services. The Army has moved a long way toward the Navy view. Recently the Air Force has been favoring a merger of the services—something which sounds like complete unification. However, there is a suspicion that the view of the Air Force may be based more upon a desire to see the adoption of a single strategy than upon carefully thought out organizational premises. Within the past year or two, the strategy which the Air Force favors has been challenged in a number of quarters and might very well not be the strategy adopted by a

At budget-cutting time the scramble for dollars is most unseemly

single or merged service. Whether this possibility will work to reduce Air Force enthusiasm for unification, only time will tell.

How much more?

Now, what are the real issues? How much more "unification" do we want? The analysis which follows concentrates on only one aspect, but an important aspect, of this problem: the role of the services. My own experience in the Pentagon during the past 14 years together with that in certain foreign military establishments, seems to support four general propositions:

- The Army, Navy and Air Force continue to perform essential functional roles and are not mere relics of a dead past.
- Service functions are the basis of service doctrine, which is the mainspring behind the development of effective fighting forces.
- The complex process involved in the organization, training and equipping of fighting forces should take place within the service which has been assigned the basic function those forces are designed to discharge.
- Basic functions should not be split between two services. This requires some adjustment of currently assigned roles and missions.

If these propositions can be substantiated, they would constitute extremely useful guidance for the further efforts at reorganization which are so sure to be forthcoming. Let us look at them more closely, one at a time.

The Services Continue to Perform Essential Functional Roles

If suddenly the services were to be merged into one, the single secretary and his single chief of staff would face an interesting organizational problem. They would surely be forced to divide their gargantuan establishment into manageable functional elements. They could, if they wished, re-create at once a land, a sea, and an air force. They might, however, consider other combinations such as a force for general war and a force for limited war; or they might think in terms of a strategic force and a tactical force. But whatever scheme they might finally adopt, it would work better or worse depending upon the logic and clarity with which the functions were divided. Therefore—and this is embarrassingly obvious—the real question is not whether there should be one service or three services or five; but rather how should the major functions be logically divided and assigned?

Historically—that is, up to World War I—there were two broad combatant functions: to fight on land and to fight at sea. When the airplane came along, it was used at first to assist the fighting on land and sea. This was logical and proper. There were still just two combatant functions. But in due course the airplane developed the new capability of overleaping the land and sea battle and striking at the heart of the enemy's country. Thus, a new combatant function evolved. For a long time, this new function was confused with the means of performing it—the airplane. But that is another story which must await its turn.

Broadly speaking, doctrine is everything the services have been, are today, or plan to be

At the present time, with a few notable variations, the three services are centered upon these three basic combatant functions. We know intellectually that the Army, Navy and Air Force only organize, train and equip forces which they then turn over to unified commanders who employ them under the strategic direction of the Secretary of Defense assisted by the Joint Chiefs of Staff. But there are some things we accept intellectually which we have not yet digested emotionally. So we continue to think instinctively in the old traditional patterns in terms of the Army, the Navy and the Air Force as the fighting services. This new relationship is subtle and is still evolving. Its essence seems to be that the services are not so much retailers from whose shelves the unified commanders pick and choose the combat elements they think they need, but rather that the services are more like the architect-builder or the designer-engineer who, as the acknowledged expert, advises the customer as to what he needs to do his job and then proceeds to produce it for him. This relationship is much like that between the Chief of Staff of the Army and his Chief Signal Officer who advises on the number and

Then comes organization and the development of tactics and techniques used by the forces

After doctrine comes the research and development of weapons to support it

kind of signal troops required and then organizes, trains and equips them.

Service functions are the basis of service doctrine and service doctrine is the mainspring behind the development of effective fighting forces.

Service doctrine is the whole process by which a fighting service is built up around a combatant function. Thus doctrine, in its broadest sense, is everything the services have been, are today, and plan to be. The development and evolution of doctrine and its inculcation, mostly in the minds and hearts of the officer corps, are the life thread and the pulse of the fighting services. By definition and natural law, doctrine is institutional in character. Doctrine and the institution which it nourishes, and in turn, upon which it feeds, are exactly coextensive. There is no doctrine outside the institutional walls—nor can the institution creep outside the doctrine which is its rationale. The practical effect of this phenomenon is that the functions, which are split between two services, result in crippled and stunted military organizations and incomplete doctrine. On the other hand, doctrine, which flows freely from functions properly and clearly assigned, is the mainspring behind the development of effective fighting forces.

There is another aspect of doctrine which bears remembering and preserving. Because the services are solemn and venerable institutions they have acquired a wide range of traditions and values, and a long history of legendary exploits, victories and successes. These too are part of doctrine although they are seldom seen or fully understood until in some epic moment they become incandescent in action as at Carentan, in the battle of Midway, on Iwo Jima, or in MIG Alley.

The complex process which leads to the development of fighting forces should take place wholly within the service which has been assigned the function those forces are designed to discharge.

The development of effective fighting forces has traditionally followed an easily discernible pattern. Although officially we use the phrase "organize, train and equip," the process is slightly more complicated and somewhat wider than these three terms imply.

Starting with doctrine, the sequence includes research and development of weapons plus the evolution of organizations that are to employ those weapons. These two, together, lead to the development of tactics and techniques in which the forces are trained. The sequence is brought to life with men, money and material through a system of programming and budgeting. Now this sequence could be expressed in any of a hundred ways; but the important fact to grasp is that all are interconnected. Traditionally, and today, the services have performed this function. The question is simply whether or not this sequence, this process, should be performed by the services, by the OSD, or by a combination of both. The several steps require closer scrutiny.

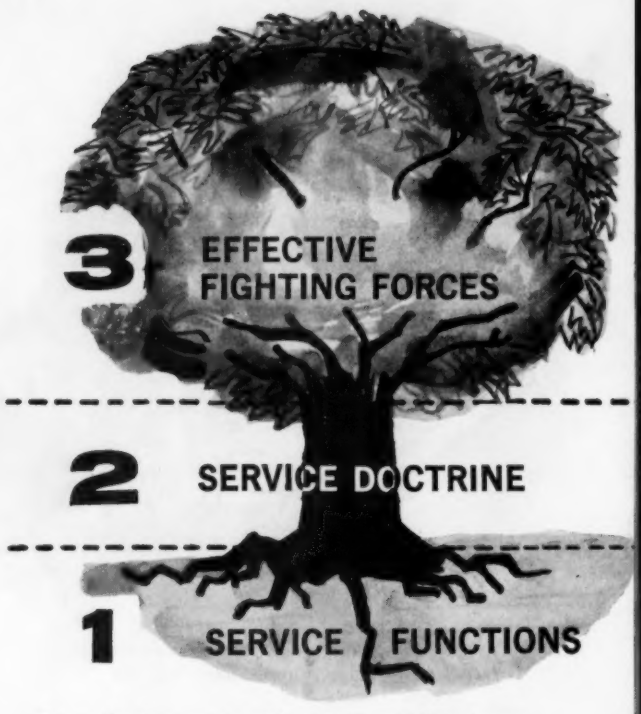
● The first step is doctrine. Men come and go, weapons change, but doctrine is constant. In this

sense, doctrine is the blueprint, the general specification for the force. Although doctrine is clearly the essential first step in producing fighting forces, neither OSD nor JCS has been able to make any doctrinal contributions on this level. Divorced by one echelon as they are, and must be, from the function of producing fighting forces, they have no basis for generating doctrine.

● The second step is research and development. The development of military characteristics for certain weapons and equipment is an outgrowth of doctrine playing, as it were, among the technical possibilities. The Army calls this process "combat development," and includes as well within the process the evolution of organization. In recent years, OSD has been active in the R&D field but chiefly in the role of referee. The function which seems to be performed by the various officials and offices in the R&D business at Defense level is one of evaluation and regulation of the R&D activities of the services when they seem to overlap or collide. OSD is not really in the creative end of R&D which draws its inspiration and thrust from the doctrinal machinery and institutional vigor of the services as they seek continuously to extend, improve, or augment their respective capabilities to perform their basic functions.

Generally speaking, agencies which lie outside a functional field have an inadequate basis for evaluation and judgment. For example, within recent years, a number of operations research agencies have appeared within, and on the fringes, of the services and OSD. Notwithstanding the high value placed by these agencies on detached scientific objectivity, the record seems to show that their most effective work has been done during periods when they have been deeply involved with one of the services as proponents or designers of weapons systems rather than as mere analysts and evaluators. In other words, the "kept" scientist is the best scientist because he enters the doctrinal environment of one of the services and works more effectively and more relevantly from within it.

● The third step is organization and training. The interaction of doctrine, weapons and organization leads to the development of tactics and techniques which are rehearsed and standardized through the process of training. Part of this function involves test and evaluation of tactics, weapons and organizations through field training exercises which in time of peace are the closest thing to combat experience. The lessons learned through these exercises are then fed back into the doctrinal process, into the R&D programs and emerge in the form of organizational modifications. Obviously, this cycling and recycling must be a closed circuit if it is to function properly. An



From the deep roots of functions and the strong trunk of doctrine, effective forces proliferate

entire field army, in a sense, is a vast, integrated weapons system. The interdependence of the working parts of the field army—that is, the integration of infantry, artillery, armor, engineers, signal and other supporting elements, is the ultimate expression of Army doctrine. The Navy and Air Force have similar talent in their functional and doctrinal fields. It has never been suggested that this group of functions could be performed outside the services. Obviously, too, it could not be divided between the services and OSD.

There are two aspects to programming which should be noted. First, that programming has become so complex and interwoven, that one change in one program usually sets off a chain reaction throughout the entire service structure. For example, a decision to stretch out the procurement of some weapon automatically affects personnel programs, training programs, deployments, maintenance and operations, and a whole network of ancillary programs relating to supporting tactical and administrative units and installations. The second important aspect to recognize about programming, is that it can be done only within a single administrative and budgetary authority, and that authority must be the one charged with the basic combatant function. This is so because changes in programs affect capabilities and usually require some re-balancing of forces. Any

rejuggling of forces requires doctrinal judgment taken in the light of the mission—that is, the function.

Theoretically, the budget simply enables the programs to take effect.

In practice, programming and budgeting are a combined operation of give-and-take. Although the programs are forced to conform to a budget ceiling, from the standpoint of our discussion the actual distribution of the budget between the various programs is the decisive process. Unless the programs and budgets are synchronized with the earlier steps involved in the production of fighting forces, then, of course, everything would be an exercise in futility.

We have seen how each step involved in the development of fighting forces flows out of a preceding step, and how the entire process is an integrated whole which draws its energy and direction from the basic doctrine of the services. We see clearly that this process belongs within a single functional element. This is why, for example, it has never been possible to centralize successfully all R&D in one defense-wide agency.

Basic functions should not be split between two services.

Just after World War I, the Royal Air Force was assigned the responsibility for providing aircraft and pilots for the Royal Navy. This split the basic function of providing weapons essential to the prosecution of the battle at sea between the Royal Air Force and the Royal Navy. During the period leading up to World War II, naval warfare was being revolutionized by the development of the aircraft carrier. The split responsibility, and the difficulties arising from it, put the Royal Navy so far behind that it never quite caught up by war's end, even though in 1937 the responsibility for carrier aircraft had been passed back to it. Even the redoubtable sailors of the British Navy found it impossible to make up for those lost years during which they did not control the development of what proved to be the primary naval weapon of World War II—the carrier aircraft. On the other hand, the U. S. Navy had full control of naval aviation and led the world in developing and using carrier aircraft.

The Italian Air Force also gathered under its wings the aircraft of the navy. At the battle of Matapan, in 1942, the reconnaissance aircraft of the Italian Air Force were elsewhere when the British Mediterranean fleet surprised and destroyed a large element of the Italian fleet. Clearly, the hapless Italian admiral did not control all the weapons systems he needed to do his job.

During World War II the Soviet Air Force, in a doctrinal and organizational sense, was dominated by the Red Army. As a consequence, that segment of the Soviet Air Force which was involved in the land battle functioned remarkably well. That portion which should have been involved in the bombardment of the German homeland remained feeble and underdeveloped to the very end of the war. The function and the doctrine of strategic bombardment was never properly developed in the Soviet system because it was submerged in an organization devoted almost exclusively to land warfare.

During 1939-40, the Luftwaffe looked like a perfect example of the feasibility of doctrinal and organizational cooperation between a separate air force and an army. We all remember the Stuka-Panzer teams which were so effective in Poland and France. But as the years went by, the German air force was drawn steadily away from the army into its own functional field. First,

The RAF and USAF set out to acquire everything with wings that flew

Duplication is neither bad nor good . . . within the bounds of common sense each service should have those weapons that will permit it to carry out its functions effectively

the bombing of Britain; then, gradually, the air defense of the German homeland. At Stalingrad and in Normandy, the army found itself without effective air support. Of course, part of this was due to the Allied victory in the battle for air superiority; but surely part was due to the fact that the German air force was drawn off into that domain which attracts the interest, the energy and the funds of both the U.S. Air Force and the Royal Air Force—the strategic bombing mission, or in the case of Germany, the defense against it.

Splits today in U. S. forces

Since 1947, there has been a steady stream of evidence that the functions of the U.S. Army and Air Force are split and confused. Unfortunately, in the very beginning, the function of strategic bombardment was confused with the means of performing it—the airplane. Only recently has this misconception begun to subside because obviously the missile has begun to perform many of the same functions. As a result of this confusion between ends and means, the Royal Air Force, and later the U.S. Air Force, set out to acquire anything and everything that flew. From a doctrinal and logical standpoint, they were quite right in acquiring the strategic bombers and those fighters required for the air defense of the continental United States and Britain. But they were quite wrong in going after naval air (the aircraft involved in the prosecution of the battle at sea) or tactical air (the aircraft involved in the battle on land). As we have seen, the Royal Air Force succeeded in getting both for a time, while the U.S. Air Force acquired only the tactical air forces designed to support the Army.

When the Army supported the creation of an independent Air Force, soldiers assumed that it would be one part of a package, the remainder of which would feature one department, one civilian secretary and a single chief of staff. Presumably, the Army believed that such a strong authority at the center would see that the new Air Force provided all the tactical air support the Army required, more or less as it had during the war. As it turned out, the Army was naive both doctrinally and politically. The Air Force became independent, all right, but no strong central authority was created. Ever since that time, the Army has been in varying degree a "dissatisfied customer" of the Air Force.

The Army depends increasingly upon aerial mobility on the battlefield to overcome terrain obstacles and to begin to redress the balance between fire and maneuver which has been thrown badly out of kilter by the nuclear weapon. Because the Air Force has been assigned the function of providing forces for close combat support, reconnaissance, interdiction and tactical airlift, the Army has been unable to control the number, the type, the deployment or the operational doctrine of many of the aircraft on which Army forces depend for success. It is worth mentioning here that in this regard the plight of the British Army is wholly pathetic. The Royal Air Force underestimates the importance of aerial mobility to the British Army, while British Army aviation is restricted to a few of the smallest artillery spotting and reconnaissance aircraft.

Within the past ten years, U.S. Army aviation has enjoyed a phenomenal growth. By recognizing the airplane as a commonplace means of getting about somewhat faster than on the ground, the Army decentralized its aircraft into all the arms and services. Every branch now uses large and increasing numbers of aircraft in the pursuit of traditional tasks. This growth cannot be explained as an attempt by the Army to invade the special province of the Air Force. Rather, it is the consequence of Army doctrine following the natural lines of the Army's basic function; and in this case, seeking to extend and improve battlefield mobility through the use of flying machines and to improve the effectiveness of its firepower by mounting it on aerial platforms.

By designing aircraft which can compete at 60,000 feet with the best the Russians can fly, the Air Force has literally and figuratively flown away from the Army. The multimillion dollar supersonic jet is not an economical weapons system for attacking enemy tanks or infantry strong points. Yet more than ever before the Army needs airborne weapons systems for this purpose. Even if one could agree with those who claim that the latest fighters are as effective in ground support as their propeller-driven predecessors, certainly it is not arguable that we can afford enough of them for this task.

No one should blame the Air Force for this state of affairs. It is drawn instinctively, powerfully and understandably to the function it considers most important: its own. It would be against all experience and logic if it were to act in any other way.

Because the Army and Air Force functions have been loosely set forth, both services have been drawn into the business of continental air defense. The Air Force entered the field initially because it believed its function was to fly airplanes for whatever purpose. It is easy to see why Army antiaircraft artillery was deployed in the air defense of the U.S. But as the Air Force begins to move away from the aircraft as its rationale and into the more stable functions of strategic bombardment and continental air defense, it becomes more and more painfully obvious that the Army is in the middle of that function with its surface-to-air missiles deployed in the continental U.S. air defense. The conduct of this defense is becoming an increasingly technical and complicated affair, as is the electronic environment in which it operates. The Air Force has long held that this complex of warning, communications, identifications systems and control of both offensive and defensive weapons systems must be completely integrated; and therefore, that the whole system must be planned, designed and operated by one agency, with one doctrine—the Air Force. The problems with Nike and Bomarc, the integration of Missile Master with SAGE, the tizzy over the Army's alleged doctrine of shoot-em-down-first-and-sort-em-out-later—these are fully predictable results of symptoms of the basic trouble which arises when functions are not carefully defined and assigned.

If the three basic functions we have described were to be aligned precisely with the three services, their charters would look something like this:

Charters for the services

The Army would be responsible for providing those forces and weapons systems required for the successful prosecution of war in the land environment which is defined as the surface of the earth, the boundary layers of air and the contiguous waters of the sea which touch the land and in which the forces and weapons systems involved are deployed and fight directly in the land battle.

The Navy would be responsible (as indeed it is now) for providing those forces and weapons systems required for the successful prosecution of war in the maritime environment. The maritime environment is defined as that area of the ocean's surface and depths and the air above them, and land on the shores of the sea, in which forces and weapons systems directly involved are deployed and fight in the maritime battle.

The Air Force would be responsible for providing those forces and weapons systems required for the offensive and defensive aspects of strategic intercontinental air and missile warfare. Specifically, the Air Force would be responsible for providing forces for bombarding the enemy's homeland, and for defending our own against enemy bombardment.

This assignment of functions is very nearly complete and logical, but some bugs remain. Duplication is not automatically an evil. For example, all the services use trucks, small arms, food, medicine, telephones, and so on; but in the more expensive fields, such as aircraft and missiles, duplication is certainly not a virtue. It would be appalling to contemplate the cost if the

Too much unification—a monstrosity ill-equipped to produce fighting forces of traditional quality

Army were to duplicate the entire technical, research and base structure behind the tactical air command. It would be absurd to imagine the Polaris submarine manned by airmen. No matter how we may yearn to force everything into our handy mold, we must observe some common sense and fiscal limitations. So, one is tempted to tinker a bit with the formula in order to eliminate what would be some obvious nonsense.

A distinguishing characteristic of the field army is the mobility of all its elements. From the infantryman on foot or in his armored personnel carrier, to the hospital on wheels, every element can pack up and move into the next field or the next county and go into combat without outside help or delay. Army aircraft can take off from unimproved airstrips and Army machine shops and gasoline supplies roll on wheels. It would be a mistake to encumber this kind of an organization —the only kind that could hope to survive in an atomic war on the ground—with weapons which are tied to concrete installations, runways or pits. Furthermore, it is too early to tell whether we are nearing the end of the era in which it is necessary for supersonic aircraft to fight a local battle for air superiority; or whether missiles have changed or eliminated that function. In any event, the kind of aircraft which take off from concrete runways are still very much involved and necessary in today's battle. VTOL and STOL aircraft, which can live and operate in the environment of the field army simply are not yet (and may never be) developed enough to fight a battle for air superiority. But some day, perhaps within this decade, two things may happen which will help solve this problem. First, it may become commonly agreed that fixed airfields are too vulnerable for use in the area of the field army. Second, the VTOL and STOL aircraft may develop the necessary capabilities and characteristics to perform all or nearly all of the tactical missions now performed by the Air Force. The jet VTOL recently built and flown by Messrs. Harlan and Wolff in Britain, would seem to be a big step in this direction.

So it would seem that the best solution from all standpoints, is to give the Army the green light on developing and using any aircraft so long as the flying machines could survive and operate in the combat environment of the field army. This means they would be STOL or VTOL, and could take off from and be maintained at mobile bases and unimproved fields. Within the limits of this stipulation, the Army's charter would include aircraft to perform the full range of missions now performed by USAF's Tactical Air Command, including close combat support, reconnaissance, interdiction, and tactical airlift. If, eventually, the Army could discharge the full tactical aviation role now being performed by the Air Force, then the Air Force would withdraw. The policing of the phase-over would be a challenging task for OSD and JCS.

The transfer of air defense could also be done in one great crashing blow, but here another possibility also exists. The current Nike Hercules battalions could be manned by Army troops for as long as those weapons remain operational. As, inevitably, they are replaced by some improved system, the Army could redeploy its personnel and funds into mobile missile systems for the air and missile defense of the field army. This purely Army need has gone begging for years, even though in the opinion of some it is a fatal weakness in army field forces.

The fighting elements of the Navy also are characterized by mobility. The Polaris submarine is designed to operate within the combat environment of the fleets at sea from which it draws its support and protection. Therefore, with regard to the Polaris problem and the problem of TAC and air defense, the most simple solution would be this one: Assign to the Army and Navy, respectively, responsibility for developing and manning all weapons systems which are deployed in a mobile configuration in the environment of the field army or the fleets at sea, and which depend upon the armies and fleets for support and protection. This addition to our basic formula leaves Polaris in the Navy. It gives Army aviation a green light. It opens the door to Army control of land mobile strategic missiles, if they are to be deployed in the area of the field army; and it leaves in Army hands the rocket weapons for air and missile defense of the field army. It gives air defense of CONUS to the Air Force and leaves the Navy with its happily balanced four-dimensional force. This kind of solution would seem to meet and establish at least one basic requirement for a sound defense organization: *that the basic functions of organizing, training and equipping land, sea and air forces should not be split between two services or between any service and OSD.*

Finally, we return to the question with which we started: How much more unification do we want? Having centered this discussion almost exclusively on the role of the services and having left unsaid the large and increasing scope of OSD and JCS, we can give only a partial answer. With certain specific modifications, we want to preserve the Army, the Navy and the Air Force as functional entities within the Department of Defense. Necessary and inevitable improvements in defense organization and in the operations of OSD and JCS should not be permitted to destroy the organizational or doctrinal environment which the services require in order to produce fighting forces of traditional quality.

POWER FROM THE SUN

Solar cells may lighten the soldier's load, give him better communications, greater mobility

Maj. Gen. EARLE F. COOK

QUITE frequently, and quite properly, the question is asked and argued: "What's all this space technology doing for the ground soldier and in his support?"

On 17 March 1958 the United States placed in orbit a tiny satellite—a sphere 6.75 inches in diameter, weighing 3.25 pounds. It was our country's second satellite. The first, Explorer I, had been successfully launched by the Army more than a month before, on 1 February.

Everyone knows about the historic Explorer I, which put America into space. It was launched in record time after the Army got the order, and it performed flawlessly, among other things discovering the Van Allen radiation belt. This alone was of singular benefit to us ground soldiers, if we are to employ space usefully for military needs.

Important as it is to isolate and discuss every significant relation of space effort to our ground operations, we could not practically tackle them all in the space of one article. I propose to examine one important point of far-reaching implications, quite distinct from the obvious objective of the satellite itself.

Army's role in Vanguard I

Perhaps many people do not know that the Army also had a vital part in the second U. S. satellite. This satellite, officially known as Vanguard I, was radio-equipped. (Vanguard I was a part of the Vanguard Program, initiated in conjunction with U. S. participation in the International Geophysical Year, 1957-58, and which involved earth satellites.) The radio's power came from that source of unlimited energy, the sun. While a year's life was the goal, at this writing the tiny satellite still continues its journey and mission through space.

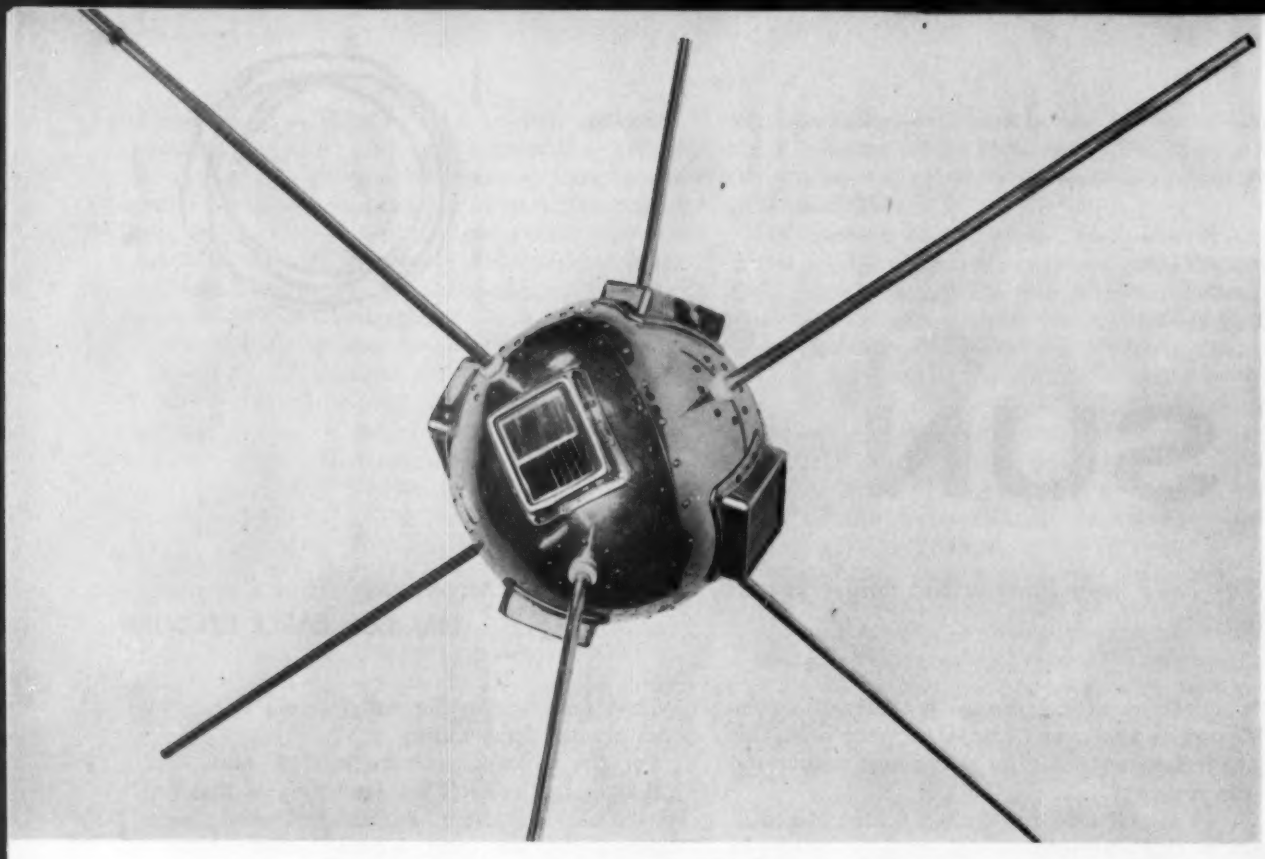
That fact causes the Army's role to assume even greater importance.

For the moment, let's go back to May 1958, just two months after the launching of this tiny sphere. At that time the Soviet Union put its third satellite into orbit. A cone-shaped vehicle, it weighed 3,000 pounds. Nothing could better express Khrushchev's glee than his own words, when he said "it would take a lot of *apelsinsputnik* to compare with ours." That coined word, *apelsinsputnik,* his name for the tiny U. S. satellite, comes from the Russian words for "orange" and their satellite. It wasn't long before editorial license changed "orange" to "grapefruit."

I doubt whether anyone today cares particularly about that giant Russian satellite that has since burned up in the earth's atmosphere. For the tiny U. S. grapefruit, there is a different story. On its third anniversary, 17 March 1961, it completed approximately 11,750 orbits, and had travelled 408,004,164 miles through space. Other satellites have remained in lengthy orbit, but for several reasons this one is rather special for us.

First of all, the small transistorized radio built into the sphere by the U. S. Naval Research Laboratory is broadcasting its faint yet certain beeps. That alone could be considered an outstanding achievement. Without those beeps we could not keep track of the sphere in space, and the other uses to which we are putting the satellite would be impossible. And most certainly it's true that the concept, the components, and the reliability of the radio are most assuredly proved. We soldiers will profit from this in designing future military equipment just as we will from the Explorers, the Discoverers, Score, Tiros I, and Courier I-B.

Vanguard I gave us a definitely determined



Still going strong on solar cells, tiny Vanguard I has been in orbit three years and is approaching half-billion mile mark. Cells power beeping transmitter while satellite is in sunlight

orbit. The course it pursues varies in distance from the earth from 404 miles when it is nearest to 2,466 miles when it is farthest. The degree of accuracy with which this orbit was calculated and is followed is such that for the first time the U. S. Army Map Service is able to use a satellite as a definite fix in determining positions of many Pacific islands never accurately located before.

The stable orbit has also been used by both military and civilian geophysicists. Many are now convinced that the earth is somewhat pear-shaped rather than an oblate spheroid—depressed or flattened at the Poles—as we thought. Numerous shapes and theories have been advanced in different parts of the world. Perhaps in Vanguard I we have a means of determining what is really the earth's true shape. At least we have a means that will be more accurate than any that have preceded it.

With a new dimension of space and its many implications to our weapons systems and current and future combat forces, the earth's exact shape is a compelling issue.

These three reasons could be worthy of a place in the sun (the pun is seriously intended) for little Vanguard I. Yet of more direct concern to us soldiers is that Vanguard literally *required* a place in the sun. The Army-developed solar converters on this satellite, which convert sunlight into electrical power, have supplied the radio transmitter its current for steady operation during these three years.

First use of solar-cell power

This was the first use of solar cell power in a satellite by anyone, anywhere. Because of their continued success in this first application by the Army, solar cells have been established as the most efficient and reliable source of electrical power for satellites and space vehicles. Numerous succeeding satellites have gone aloft with their clusters of solar cells.

This pioneering use by the Army of power from the sun, a feature lost on those who measure success in space by tonnage, is becoming more and more the most important aspect of the success of that "grapefruit."

There was considerable concern among scientists that micrometeorites striking the satellite in space would fog or damage the glass that covers the solar cells. It was thought that their effective life would be relatively short. Actually, the radio signal is about as strong today as it was three years ago. Because of the effectiveness of

these solar cells, they are thus supplying as much power to the transmitter each time the satellite is in sunlight.

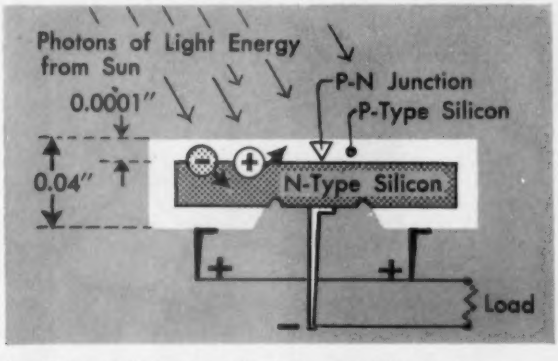
This success wasn't all a matter of luck, nor was it too much of a gamble. Early in 1957, Army Signal Corps scientists experimented at the White Sands Missile Range to prove their theory that solar cells answered the problems of missile and space-vehicle power supply. Several glass-protected solar-cell clusters were attached to an Aerobee-Hi rocket, which was fired to an altitude of 190 miles. The solar cells supplied the power to operate a radio that sent signals back to earth to indicate that the cells were functioning perfectly.

Intense heat was generated by the rocket's speed through the atmosphere at more than a mile a second. The cells underwent the adverse effect of rapid acceleration and spin. In some respects, these conditions were more severe than those the cells would encounter as part of a satellite. At least during passage through the atmosphere a satellite could be protected against heat and friction by the nose cone of the launch vehicle. The solar cells worked as planned, in spite of these adverse conditions.

Subsequently the Navy was given responsibility for the Vanguard Program by the Department of Defense. When planning the satellite the question arose of power for the transmitter. Navy scientists called upon the Army for assistance. They knew of the successful White Sands rocket experiment, and they knew the Army Signal Corps could prepare the solar-cell clusters.

What are solar cells?

Here we might refresh our minds as to what these solar cells are. In 1954 the Bell Laboratories announced the invention of the solar cell. This was "the result of the same research that produced the transistor"—a small solid-like device that replaced many tubes and which is used in much of the equipment being developed today for the modern Army. Tactical radios have them, and a major example is the Army's Courier I-B communications satellite which used both transistors *and* a skin of solar cells.



Sunlight striking certain types of silicon sets up electronic reaction. Cross-section of cell shows structure, circuit and microscopic tolerances

In simplified terms, scientists found that a piece of practically pure silicon impressed with a thin layer of silicon having certain impurities would result in a bond that was sensitive to radiant energy. That is, the bond between the two layers of silicon would react to radiance such as the sun's. An electrical circuit could be connected with this bond, and when the bond was exposed to sunlight, or other light sources for that matter, the light was "converted" directly into electric current or energy. That is the solar cell.

A solar cell is shown graphically on this page. From the dimensions, it becomes apparent that it is a real problem to work with metal of such thinness. For example, in order to produce the layer of silicon *one ten-thousandth of an inch thick,* temperatures of the order of 1,400 degrees Centigrade are required. Yet there is motivation for such demanding tasks. The solar cell produced in 1954 had a greater efficiency of light conversion than any other direct light-to-electricity converter known at the time—an efficiency of about six per cent.

This basic cell was improved by the industry. Those cells the Army Signal Corps obtained for use in building a solar converter for Vanguard I had an efficiency of about eight per cent. It is these cells which we now expect will continue to work effectively for several lifetimes.

Still, Army scientists were not satisfied with the available solar cells. Theories and experiments, and high-altitude nuclear tests, indicated that any space vehicle or satellite might well be exposed to nuclear radiation. They found that solar cells could be damaged by such radiation. Scientists of the Signal Research and Development Agency (USASRDA) produced an improved solar cell which "is perhaps the most important advance in the field since the first solar cell was produced in 1954." These cells will resist about four times the radiation for much longer periods of exposure. They are also produced at about 950 degrees Centigrade, which gives a higher percentage of good cells at a greatly reduced cost.

Our outlook on power from the sun for missiles and space vehicles grows more promising than ever.

Greater ground-combat capability

Now, a fair question might be: "How does all this give our Army a greater combat capability?"

In June 1957 an Army press release said, "The

One-sun shay. Just a year ago, 10,000 silicon solar cells actually powered this Baker electric auto

helmet radio being developed by the Army may soon need only exposure to sunlight to obtain all the electrical power necessary to operate both its transmitter and receiver for as long as a year." Engineers at USASRDA used a model (below, right) to prove that solar cells could power the world's smallest transmitter-receiver. We haven't got that solar-powered helmet radio yet, because we have not been able to bring the costs to within reasonable limits. I believe that ultimately that problem also will be solved.

This solar cell which was first put to use by the Army in space, may practically be used some day by our soldiers in lightweight tactical radios.

On 21 June 1960 an operator at an Army radio station at Fort Monmouth, New Jersey, spoke into his microphone in a call to a radio station on the West Coast. The reply came back, loud and clear. "Routine!" you might say. Routine, yes—except that each station used as its source of power a 20-foot-square blanket of tiny solar cells. For the test each station was using average power of 100 watts—not a specially reduced degree of power. Since then the Monmouth station has been in contact with Europe, Africa, and Australia.

This experiment shows that eventually the Army may also use the solar cell and the sun's natural energy for longer-range radio communication.

In Los Angeles, on 3 March 1960, a Baker Electric automobile (above) was driven with a panel of solar cells mounted on its top. The power from the cells propelled the car. The *Newsletter* of the Association for Applied Solar Energy included this significant remark: "While the odd looking vehicle seems to have no practical use *at the moment* [italics mine], it certainly is no more unusual than the gas buggies of the 1900 vintage."

Here are only three examples of ground uses to which solar cells have been put in the research and experimental field. The solar cell is coming into its own for use where commercial electrical power is lacking or where normal power sources such as batteries and generators cannot be used for various practical reasons. Certainly the military applications are evident.

In these instances of ground applications, the electric power from the solar cells was fed into a storage device. It was taken from this storage device as needed. But let's go up to our tiny satellite again.

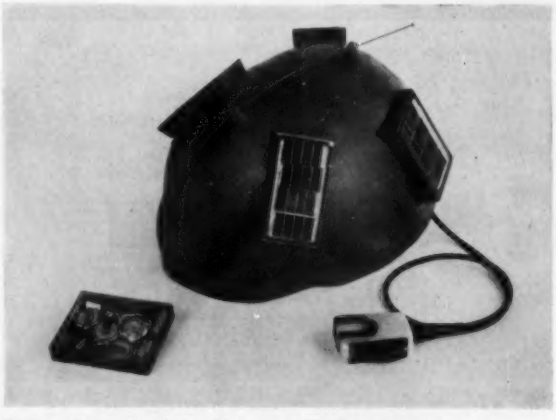
From light to electricity

I mentioned that the power was reaching the transmitter each time the satellite is in the sunlight. When the predicted second arrives for the satellite to reemerge from the earth's shadow, at that instant the radiant energy from the sun strikes the solar cells. The conversion from light to electricity occurs and the transmitter should begin beeping again. Thus far, it always has.

Unlike the case of the automobile, for example, there is no storage device on board the satellite. There was not enough room inside that early tiny sphere. The solar cells are coupled directly to the transmitter and the radio is silent whenever the satellite is within the earth's shadow.

The Army's 500-pound Courier I-B was equipped with a means of storing the energy produced by the nearly 20,000 solar cells around its surface. Miniature batteries—a nickel-cadmium type also developed by the Army—are kept charged by Courier's solar converters. These supply power when the communications satellite is within the earth's shadow.

Everyone is familiar with this principle. Perhaps the most common example is the combination of generator and storage battery in our cars. The most practical method available for storing our power from the sun is this use of a battery. This is so even though last night someone on a



Topee for a talk in the sun. Under development is helmet radio which will be powered by sun while charging nickel-cadmium batteries

field problem or on guard somewhere may have had his flashlight go out and leave him in total darkness at a critical moment. In this battery most familiar to us the energy dissipates.

Batteries have other faults, too. Sometimes they are too bulky and too heavy for enough power, too inefficient, too limited in the number of times they can be recharged, or can be recharged at all. Also, they are costly for the return they give. Yet this introspection about batteries is only to suggest disadvantages that have made the Army look to other sources of power for various purposes. I do not say batteries are unnecessary or that they have not been improved. Far from it.

For several years now the Army has been charged with the responsibility for batteries and battery research and development for the three services. There are some exceptions, but these are in highly specialized fields of application. The research effort by Army scientists and by contract with industry has led to many worthwhile improvements in batteries.

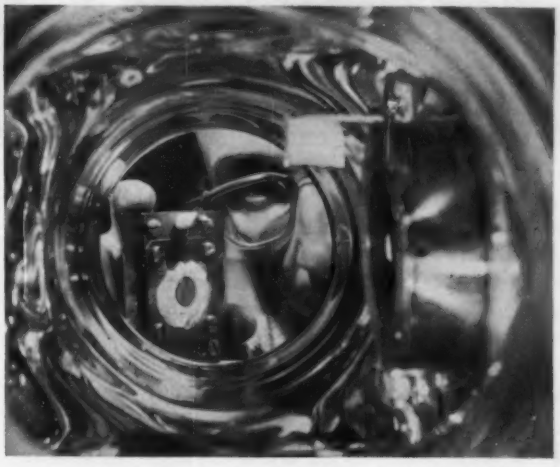
For example, during the past 12 years, the capacity of the common flashlight battery has been improved sevenfold. The rechargeable battery, generally called the storage battery, also has been improved. Atomic batteries and the miniature nickel-cadmium type mentioned earlier have been developed.

This last type is used in the proved battery system of most Army missiles. The original nickel-cadmium battery was somewhat crude in design and it was a serious problem to keep it on the shelf until it was needed.

Improved types of batteries

The Army Signal Research and Development Agency and the Army Ordnance Missile Command worked closely in developing a new type battery which can be activated in seconds just prior to use. During the past two years this battery—a zinc-silver oxide type—and "each of its components were designed, re-designed where required and thoroughly evaluated to meet the extremely reliable performance required under all of the stringent conditions it will require in missile operation—such as shock, acceleration, vibration, high and low temperatures."

For our purpose of taking power from the sun the nickel-cadmium battery holds great promise. Some of these nickel-cadmium batteries have been used through *ten thousand* cycles of charge and recharge. A sealing process has helped in solving shelf life and some weight reduction has been achieved. So far as I know, every satellite that carries a combination of solar cell and battery into space has used this type of battery as the storage device.



A-radiation resistant cell gets check of atomic endurance in Van de Graaf particle accelerator

This sealed nickel-cadmium battery is rather expensive and currently its use is somewhat limited. I am confident, though, that the problem of cost will be resolved and that future research and development will give us a relatively cheap battery, particularly for ground use. Maybe this will eliminate the flashlight, which is a more personal point to many!

Using the knowledge gained

Just where do we stand in direct conversion of sunlight to electrical power? Let's look at some concrete examples of what we have done. In Vanguard I (1958) we produced and used intermittently some 10 milliwatts; in Explorer VII (1959) we used 5 watts; in Tiros (1960), some 19 watts. Progress, to be sure.

We are far ahead of where we were three years ago, but we are far short of where we ought to be. Scientists of the services and in industry are investigating solar furnaces, solar concentrators, and heat exchangers. They are experimenting with fuel cells with reactivation capabilities. They are exploring reversible chemical reactions. They are studying thermal, mechanical and chemical methods of storing power. All these are stories that have individual relation to us soldiers. They represent other ways and means which will affect our combat capability—some perhaps tomorrow, some in years to come.

While many of the new approaches are not taking power from the sun directly, the knowledge we have gained will help us produce better power supplies. I believe, however, that today a real payoff remains in taking more and more power from the sun. The tiny solar converter the Army developed for that scientific citrus may well be the signpost that will show us the way.

The Bowling

Lt. Col. ROY E. APPLEMAN

This article is drawn from South to the Naktong, North to the Yalu, *to be published 25 June 1961 by the Office of Military History, Department of the Army. It is the first volume dealing with operations in the projected series on* The United States Army in the Korean War.—THE EDITORS.

THE 27th Infantry Regiment of the 25th Division had just completed its mission of clearing the North Koreans from the southern part of the Naktong Bulge area in the 24th Division's sector when the enemy pressure north of Taegu caused new alarm at Eighth Army headquarters. Acting on the threat from this quarter, Eighth Army on 14 August [1950] relieved the regiment from attachment to the 24th Division and the next day ordered it northward to Kyongsan in army reserve. At noon on 17 August, Eighth Army ordered the 27th Infantry to move its headquarters and a reinforced battalion "without delay" to a point across the Kumho River three miles north of Taegu on the Tabu-dong-Sangju road "to secure Taegu from enemy penetration" from that direction. ROK sources reported that a North Korean regiment, led by six tanks, had entered the little village of Kumhwa, two miles north of Tabu-dong.

The 1st Battalion, 27th Infantry; a platoon of Heavy Mortar Company; and the 8th Field Artillery Battalion, less its Battery B, moved north of Taegu at noon. Later in the day this force moved two miles farther north to Ch'ilgok where the ROK 1st Division's command post was located. By dark, the entire 27th Regiment was north of Taegu on the Tabu-dong road, reinforced by Company C, 73d Tank Battalion. Alarm spread in Taegu where artillery fire to the north could be heard. Eighth Army ordered the 37th Field Artillery Battalion, less its Battery A, to move from the Kyongju-P'ohang-dong area for attachment to the 27th Infantry in order to reinforce the fires of the 8th Field Artillery Battalion above Taegu. It arrived there the next day. To the south at this same time the critical battle at Obong-ni

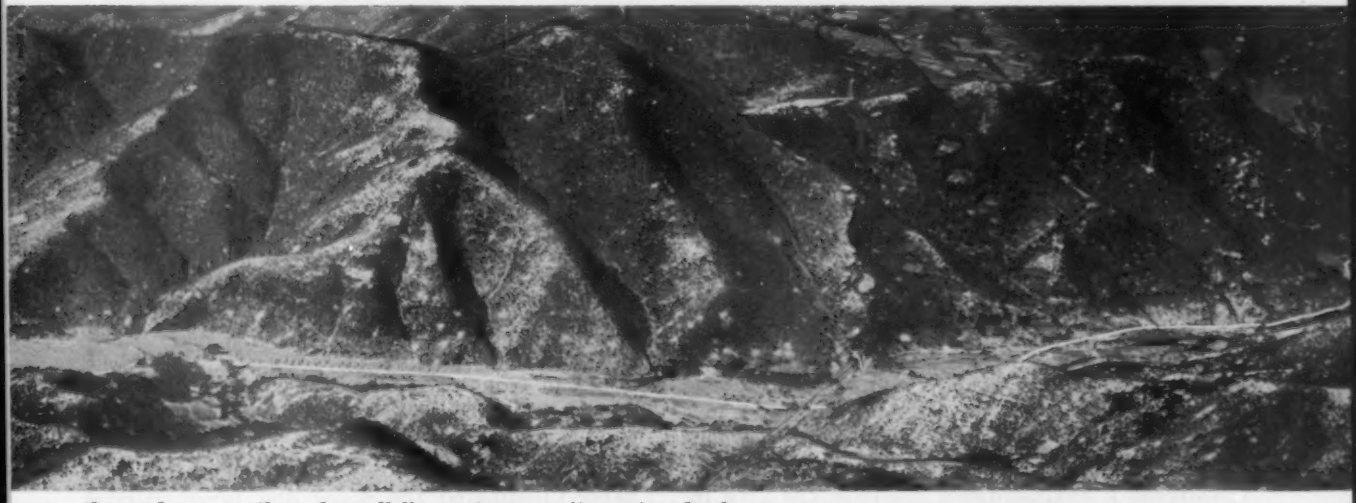
The bowling alley and the heights beyond. From left to right

On seven successive nights powerful the bowling alley but couldn't register

Alley Fights

Ridge and Cloverleaf Hill was still undecided.

When Eighth Army on 18 August ordered the 27th Infantry Regiment to attack north along the Sangju-Taegu road, the North Korean 13th Division, beefed up with T34 tanks, was astride the road just above Tabu-dong and only 13 miles from Taegu. Two regiments of the ROK 1st Division were to attack along high ground on each side of the road. The plan called for a limited objective attack to restore the ROK 1st Division's lines in the vicinity of Sokchok, a village four miles north of Tabu-dong. The line of departure was just north of Tabu-dong. Pershing M26 tanks of Company C, 73d Tank Battalion, and two batteries of the 37th FA Battalion were to support the 27th Infantry.



the road runs northward paralleling a stream on its western bank

As the trucks rolled northward from Tabu-dong and approached the line of departure, the men inside could see the North Koreans and ROKs fighting on the high hills overlooking the road. The infantry dismounted and deployed, Lieutenant Colonel Gilbert J. Check's 1st Battalion on the left of the road and Lieutenant Colonel Gordon E. Murch's 2d on the right of it. With tanks leading on the road, the two battalions crossed the line of departure at 1300. The tanks opened fire against the mountain escarpments, and the rumble of their cannonade echoed through the narrow valley. The infantry on either side of the road swept the lower hills, the tanks on the road pacing their advance to the infantry's. An enemy outpost line in the valley withdrew and there was almost no opposition during the first hour. This enemy outpost line proved to be about two and a half miles in front of the main positions. The 27th Infantry had reached a point about two miles north of Tabu-dong when Colonel John H. Michaelis, regimental commander, received word that neither of the ROK regiments on the high ground flanking the valley road had been able to advance. He was ordered to halt and form a perimeter defense with both battalions astride the road.

THE two battalions of the 27th Infantry went into a perimeter defense just north of the little mud-thatched village of Soi-ri. The 1st Bat-

enemy infantry and armor rolled down a ten-strike against the Wolfhounds

talion, on the left of the road, took a position with Company C on high ground somewhat in advance of any other infantry unit, and with Company A on a ridge behind it. On their right, Company B, somewhat in advance of Company A, carried the line across the stream and the narrow valley to the road. There the 2d Battalion took up the defense line with Company E on the road and east of it and Company F on its right, while Company G held a ridge behind Company F. Thus, the two battalions presented a four-company front, with one company holding a refused flank position on each side. A platoon of tanks took position on the front line, two tanks on the road and two in the stream bed; four more tanks were back of the line in reserve. The artillery went into firing positions back of the infantry. Six bazooka teams took up positions in front of the infantry positions along the road and in the stream bed. The ROK 1st Division held the high ground on each side of the 27th Infantry's positions.

In front of the 27th Infantry's position, the poplar-lined Taegu-Sangju road ran northward on a level course in the narrow mountain valley. A stream on the west closely paralleled it. The road was nearly straight on a north-south axis through the 27th Infantry's position and for some distance northward. Then it veered slightly westward. This stretch of the road later became known as the "Bowling Alley."

A little more than a mile in front of the 27th Infantry's position the road forked at a small cluster of houses called Ch'ong'yong-dong; the left-hand prong was the main Sangju road, the right-hand one the road to Kunwi. At the road fork, the Sangju road bends northwestward in a long curve. The village of Sinjumak lay on this curve a short distance north of the fork. Hills protected it against direct fire from the 27th Infantry's position. It was there, apparently, that the enemy tanks remained hidden in the daytime.

The Kunwi and Sangju roads from the northeast and northwest entered at Ch'ong'yong-dong, the natural and easy corridor between Huhag-sen and Ka-san leading into the Taegu basin. The battles of the Bowling Alley took place just south of this road junction.

THE first of seven successive enemy night attacks struck against the 27th Infantry's defense perimeter shortly after dark that night, 18 August. Enemy mortars and artillery fired a heavy preparation for the attack. Two enemy tanks and a self-propelled gun moved out of the village of Sinjumak two miles in front of the 27th Infantry's lines. Infantry followed them, some in trucks and others on foot. The lead tank moved slowly and without firing, apparently observing, while the second one and the self-propelled gun fired repeatedly into Company F's position. The tank's machine-gun fire seemed indiscriminate, as if the enemy did not know the exact location of the American positions. As the tanks drew near, a 3.5-inch bazooka team from Company F destroyed the second one in line. Bazooka teams also hit the lead tank twice but the rockets failed to explode. The crew, however, abandoned the tank. Fire from the 8th FA Battalion knocked out the self-propelled gun, destroyed two trucks, and killed or wounded an estimated hundred. Lieutenant Lewis Millett, an artillery forward observer, who later earned the Medal of Honor, directed this fire on the enemy as a T34 tank hovered within 50 yards of his foxhole. Three more enemy tanks had come down the road, but now they switched on their running lights, turned around, and went back north. Half an hour after midnight the entire action was over and all was quiet. Enemy troops made a second effort, much weaker than the first, about two hours later, but artillery and mortar fire dispersed them.

Certain characteristics were common to all the night battles in the Bowling Alley. The North Koreans used a system of flares to signal various actions and to coordinate them. It became quickly apparent to the defending Americans that green flares were used to signal an attack on a given area. So the 27th Infantry obtained its own green flares and then, after the enemy attack had begun, fired them over its main defensive positions. This confused the attacking North Koreans and often drew them to the points of greatest strength where they suffered heavy casualties. The use of mines in front of the defensive positions in the narrow valley became a nightly feature of the battles. The mines would stop the tanks and the infantry would try to remove them. At such times flares illuminated the scene and pre-registered artillery and mortar fire came down on the immobilized enemy with fatal results.

ON the morning of 19 August, the ROK 11th and 13th Regiments launched counterattacks along the ridges with some gains. General Walker ordered another reserve unit, a battalion of the ROK 10th Regiment, to the Taegu front to close a gap that had developed between the ROK 1st and 6th Divisions. In the afternoon he ordered still another unit, the U. S. 23d Infantry, to move up and establish a defensive perimeter around the 8th and 37th FA Battalions eight miles north of Taegu. The 3d Battalion took up a defensive position around the artillery while the 2d Battalion occupied a defensive position astride the road behind the 27th Infantry. The next day the two battalions exchanged places.

Sunday, 20 August, was a day of relative quiet on the Taegu front. Even so, United States air-

craft attacked North Korean positions repeatedly during the day. The planes began their strafing runs so close in front of the American infantry that their machine-gun fire dotted the identification panels, and expended caliber .50 cartridges fell into friendly foxholes. General Walker visited the Taegu front during the day, and later made the statement that enemy fire had decreased and that Taegu "certainly is saved."

By contrast, that night was not quiet. At 1700, a barrage of enemy 120mm mortar shells fell in the area of the Heavy Weapons Company. A bright moon silhouetted enemy tanks against the dark flanking mountains as they rumbled down the narrow valley, leading another attack. Artillery and mortar fire fell among them and the advancing enemy infantry. Waiting Americans held their small-arms and machine-gun fire until the North Koreans were within from 150 to 200 yards' range. The combined fire of all weapons repulsed this attack.

The next morning, 21 August, a patrol of two platoons of infantry and three tanks went up the road toward the enemy positions. White flags had appeared in front of the American line, and rumors received from natives alleged that many North Koreans wanted to surrender. The patrol's mission was to investigate this situation and to form an estimate of enemy losses. The patrol advanced about a mile, engaging small groups of enemy and receiving some artillery fire. On its way it completed the destruction with thermite grenades of five enemy tanks disabled in the night action. The patrol also found a 37mm antitank gun, two self-propelled guns, and a 120mm mortar among the destroyed equipment of the enemy, and saw numerous enemy dead. At the point of farthest advance, the patrol found and destroyed an abandoned enemy tank in a village schoolhouse courtyard.

That evening at dusk the 27th Infantry placed an antitank mine field, antipersonnel mines, and trip flares across the road and stream bed 150 yards in front of the line. A second belt of mines, laid atop the ground, was placed about 100 yards in front of the buried-mine field.

LATER that evening, 21 August, the North Koreans shelled the general area of the 27th Infantry's positions until just before midnight. Then the NK 13th Division launched a major attack against the ROK units on the high ground and the Americans in the valley. Nine tanks and several SP guns supported the enemy troops in the valley. Because it was on higher ground and more advanced than any other American unit, Company C on the left of the road usually was the first to detect an approaching attack. That evening the commander of Company C telephoned that he could hear tanks out front. When the artillery fired an illuminating shell he was able to count 19 vehicles in the attacking column on the road. The tanks and self-propelled guns, firing rapidly, approached the American positions. Most of their shells landed in the rear areas. Enemy infantry moved forward on both sides of the road. Simultaneously, other units attacked the ROKs on the high ridges flanking the valley.

American artillery and mortar fire bombarded the enemy, trying to separate the tanks from the infantry. Machine-gun fire opened on the NK infantry only after they had entered the mine field and were at close range. The Pershing tanks in the front line held their fire until the enemy tanks came very close. One of the American tanks knocked out the lead enemy tank at a range of 125 yards. A 3.5-inch bazooka team from Company F knocked out a SP gun, the third vehicle in column. The trapped second tank was disabled by bazooka fire and abandoned by its crew. Artillery and 90mm tank fire destroyed seven more enemy tanks, three more SP guns, and several trucks and personnel carriers. This night battle lasted about five hours. The fire from both sides was intense. On the American side, a partial tabulation shows that in support of the 2d Battalion of the 27th Infantry, Battery B of the 8th FA Battalion (105mm howitzers), fired 1,661 rounds; the 4.2-inch mortar platoon fired 902 rounds; the 81mm mortar platoon fired 1,200 rounds; and Company F itself fired 385 60mm mortar rounds. The enemy column was destroyed. Patrols after daylight counted enemy dead in front of the perimeter position, and on that basis, they estimated the North Koreans had suffered 1,300 casualties during the night battle. Eleven prisoners captured by the patrol said the action had decimated their units and that only about one-fourth of their number remained. The North Korean division commander blamed the 19th Regiment for incompetence and failure to correlate its action with the rest of the division in this battle.

THE men of Company F, 27th Infantry, apparently coined the name Bowling Alley during the night battle of 21-22 August. The enemy's T34 tanks fired armor-piercing shells straight up the road toward the American positions, hoping to knock out the U. S. tanks. The balls of fire hurtling through the night and the reverberations of the gun reports appeared to the men witnessing and listening to the wild scene like bowling balls streaking down an alley toward targets at the other end.

During the night battle, enemy forces infiltrated along the high ridge line around the east flank of the 27th Infantry and appeared the next day about noon six miles in the rear of that regi-

ment and only nine miles from Taegu. This enemy force was the 1st Regiment of the NK 1st Division which had just arrived from the Kunwi area to join in the battle for Taegu. It brought the main supply road of the 27th Infantry under small-arms fire along a five-mile stretch, beginning at a point nine miles above Taegu and extending northward.

About this time, Colonel Michaelis sent an urgent message to Eighth Army saying that the ROK troops on his left had given way and that "those people are not fighting." Prisoners told him, he said, that about a thousand North Koreans were on his west flank. He asked for an air strike.

It must not go unnoticed that all the time the 27th Infantry and supporting units were fighting along the road, the ROK 1st Division was fighting in the mountains on each side. Had these ROK troops been driven from this high ground, the perimeter position of the 27th Infantry Regiment would have been untenable. Several times the ROK troops came off the mountains in daytime looking for food in the valley and a bath in the stream. But then, supported by the American artillery, they always climbed back up the heights and reoccupied the high ground. The ROK 1st Division must receive a generous share of the credit for holding the front north of Taegu at this time.

General Paik bitterly resented the charge by Colonel Michaelis that his men were not fighting. He said he would like to hold the valley position with all the tank and artillery support given the 27th Regiment while that regiment went up on the hills and fought the night battles with small arms. Eighth Army's G3 staff investigated the charge by Colonel Michaelis that the ROK troops had left their positions. KMAG officers visited all the ROK 1st Division's units. The assistant G3 went to the ROK front personally to inquire into the situation. All reports agreed that the ROK units were where General Paik said they were.

A BIT of drama of a kind unusual in the Korean War occurred north of Tabu-dong on the 22d. About 1000, Lieutenant Colonel Chong Pong Uk, commanding the artillery regiment supporting the NK 13th Division, walked up alone to an ROK 1st Division position three miles north of Tabu-dong. In one hand he carried a white flag; over his shoulder hung a leather map case. The commanding general of the 13th Division had reprimanded him, he said, for his failure to shell Tabu-dong. Believing that terrain obstacles made it impossible for his artillery fire to reach Tabu-dong and smarting under the reprimand, Chong had deserted.

Colonel Chong, the highest ranking prisoner thus far in the war, gave precise information on the location of his artillery. According to him, there were still seven operable 122mm howitzers and 13 76mm guns emplaced and camouflaged in an orchard four and a half miles north of Tabu-dong, in a little valley on the north side of Yuhak-san. Upon receiving this information, Eighth Army immediately prepared to destroy the enemy weapons. Fighter bombers attacked the orchard site with napalm, and U. S. artillery took the location under fire.

During the night of 22-23 August, the enemy made his usual attack against the 27th Infantry, but not in great force, and was easily repulsed. Just before noon on the 23d, however, a violent action occurred some distance behind the front line when about a hundred enemy soldiers, undetected, succeeded in reaching the positions of Company K, 27th Infantry, and of the 1st Platoon of Company C, 65th Engineer Combat Battalion. They overran part of these positions before being driven off with 50 killed.

Meanwhile, as ordered by General Walker, the 2d Battalion, 23d Infantry, after repelling several night attacks, counterattacked at dawn, 23 August, and seized the high ground overlooking the road at the artillery positions. At the same time the 3d Battalion started an all-day attack that swept a three-mile stretch of high ground east of the road. This action largely cleared the enemy from the area behind and on the flanks of the 27th Infantry. At 1335 in the afternoon, Colonel Michaelis reported from the Bowling Alley to Eighth Army that the NK 13th Division had blown the road to his front, had mined it, and was withdrawing.

The next day, 24 August, the 23d Infantry continued clearing the rear areas and by night it estimated that there were not more than 200 of the enemy behind the forward positions. The Bowling Alley front was quiet on the 24th except for an unfortunate accident. An Eighth Army tank recovery team came up to retrieve a T34 tank that had stopped just in front of the American forward mine field. As the retriever began to pull the T34 forward, an American mine unseen and pushed along in some loose dirt underneath the tank, exploded, badly damaging the tank and wounding 12 men standing nearby.

SHORTLY after midnight of 24 August, the North Koreans launched what had by now become their regular nightly attack down the Bowling Alley. This attack was in an estimated strength of two companies supported by a few tanks. The 27th Infantry broke up this fruitless attempt and two more enemy tanks were destroyed by the supporting artillery fire. This was the last night the 27th Infantry Regiment spent

The stretch of poplar-lined road down which the tanks are moving was in front of the 27th's perimeter

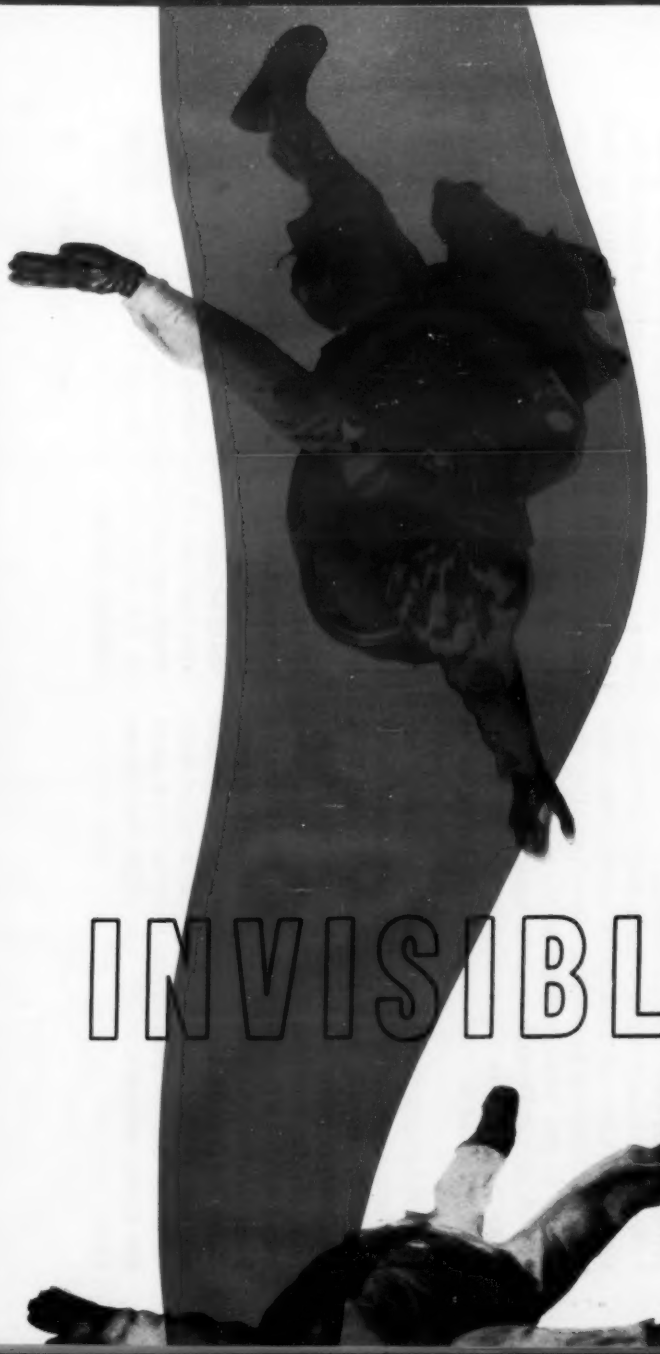
in the Bowling Alley. The confirmed enemy loss from 18 to 25 August included 13 T34 tanks, 5 self-propelled guns, and 23 vehicles.

With the enemy turned back north of Taegu, General Walker on 24 August issued orders for the 27th Infantry to leave the Bowling Alley and return to the 25th Division in the Masan area. The ROK 1st Division was to assume responsibility for the Bowling Alley, but the U. S. 23d Regiment was to remain north of Taegu in its support.

As if to signalize the successful defense of the northern approach to Taegu in this week of fighting, a 20-year-old master sergeant of the ROK 1st Division executed a dangerous and colorful exploit. Master Sergeant Pea Sung Sub led a nine-man patrol 6,000 yards behind the North Korean lines to the NK 13th Division's command post. There his patrol killed several enemy soldiers and captured three prisoners whom they brought back with no loss to themselves. General Paik gave the daring sergeant 50,000 won ($25) for his exploit.

COLONEL Murch's 2d Battalion and Colonel Check's 1st Battalion of the 27th Infantry had gained something of a reputation for themselves in the Bowling Alley north of Taegu. The defense in depth behind their front line by the 2d and 3d Battalions of the 23d Infantry had frustrated all enemy efforts to gain control of the gateway to Taegu. The supporting tanks and the artillery had performed magnificently. During the daytime, Air Force attacks had inflicted destruction and disorganization on the enemy. And on the mountain ridges walling in the Bowling Alley, the ROK 1st Division had done its full share in fighting off the enemy thrust.

Survivors of the 1st Regiment of the NK 1st Division joined the rest of that division in the mountains east of the Taegu-Sangju road near the walled summit of Kas-an. Prisoners reported that the 1st Regiment was down to about 400 men and had lost all its 120mm mortars, 76mm howitzers, and antitank guns as a result of its action on the east flank of the NK 13th Division at the Bowling Alley.



Armed men, falling silently and accurately through the night from 8,000 feet on a pre-determined target, are a tactical innovation offered by military sky divers who see it as a technique of use in many missions

Lt. HAROLD C. LYON, JR.

INVISIBLE INFILTRATORS

● Free-fall parachute jumping, or sky diving, a sport which is fast sweeping the world, lends itself to military application. Members of Fort Campbell's parachute club have ventured afield to pioneer in adapting sky diving so as to give a new twist to vertical infiltration.

The club has made more than 50 tac- 55 seconds all three were in radio contact with the helicopter and had set up a V on the ground for the chopper to land. While it was impossible for observers on the ground to see the chutes in the air, jumpers could easily see those of other troopers about them. It is unlikely that during combat radar will

tical night jumps, each trooper carrying some 50 pounds of military equipment. In free falls at night on unknown areas (no drop zone) they have carried M1 rifles, PRC/10 radios, 3.5 rocket launchers, and full field packs complete with horseshoe rolls and gas masks.

These jumps were from aircraft cruising silently at altitudes of 8,000 to 20,000 feet. Their accuracy proved phenomenal. With no aids other than air weather service wind readings, troopers have repeatedly landed within 300 yards of target even on the blackest nights and under the worst conditions of visibility.

Officers of the 101st Airborne Division couldn't believe club members' claims regarding assembly time, accuracy, secrecy of envelopment, and equipment that could be carried. One black night the Doubting Thomases were shown at a lonely stretch of the Fort Campbell reservation.

Not one man on the ground heard the apparently invisible helicopter 8,000 feet above. No one detected the six combat-equipped troopers who silently dived through the blackness to open their steerable parachutes at 2,000 feet. Before their audience had realized it, all six had gone out of the blackness onto the hillside to their position. Ten minutes after they left the aircraft (it had radioed the ground observers) at 8,000 feet they had all assembled with chutes rolled up in kit bags.

During another night test, three men with combat equipment, including a PRC/10, jumped at 8,000. Again the aircraft radioed ground observers when the jumpers left the plane. In 3 minutes pick up the falling body of a free-fall jumper. Accordingly, radar which might pick up the high-flying plane would never reveal that troopers had been released in the enemy's rear area.

It's about time we visualized the military implications of such feats. The Russians have thousands of qualified free-fall jumpers who were trained in government-operated schools. Men and women who graduate from these schools must jump at night from 35,000 feet while wearing oxygen masks.

In the French Army, a student must complete two military free-fall jumps in order to qualify as a paratrooper. Most of France's parachute force is made up of reservists who belong to civilian sky-diving clubs.

The silent free-faller would be a distinct asset to our armed forces for speial missions such as destroying key installations behind enemy lines. The risk of infiltrating through alert enemy front lines and obstacles would be eliminated. Special Forces type teams could free-fall from aircraft flying in the relative secrecy of high altitude to drop swiftly, silently, and with extreme accuracy in their objective area. Our chances of getting patrols into the enemy's rear would be much improved, and the men would be far less tired upon arrival. This method of entry is also surer than a helicopter landing. The presence of a copter at low altitudes immediately suggests to the enemy that we're carrying in troops.

Normally, combat control or pathfinder teams prepare drop zones two hours to 30 minutes prior to the main drop from low-flying aircraft. This tips

off the coming assault to the enemy. Free-falling pathfinder teams could slip in unseen, accurately and silently, to prepare the area for a truly surprise airborne assault.

We can draw some conclusions regarding the military implications of such a technique by examining three tactical free falls made by Fort Campbell troopers at night. These were made with combat equipment against units of the 101st Airborne during Army Training Tests.

On the first jump Aggressor free-fallers knew only the general location of the enemy battle group's command post, which was not near a cleared area or drop zone. They briefed the H-34 pilot, showing the map location of the target area. Loaded with complete battle gear, SFC Harold Lewis and his five-man patrol spread-eagled into the inky blackness 8,000 feet above their objective, darting earthward for 40 seconds at speeds of some 120 miles an hour.

At the precise moment when their luminous-dial altimeters registered 2,000 feet, they flared out from one another, actuated their modified steerable parachutes, and used the lowest man as assembly guide. In the darkness they could distinguish one another's chutes much easier in the air than when on the ground. Landing within 50 yards of one another, this Aggressor free-fall patrol was chagrined to learn they were 100 yards from the battle group's trains area. Apprehension changed to delight when they found their entry had been undetected. Enemy troops moving all about them had failed to notice their silent vertical infiltration. The faint whir of the helicopter 8,000 feet above was too dim to attract attention or even hint of danger.

The patrol quickly rolled chutes and hid them in the weeds. A recon team of two quickly surveyed the objective, returning with enough information to formulate an attack plan. Under cover of a security team an assault force moved forward using tear gas followed by M49 trip flares as simulated thermite grenades. The patrol managed to raise complete havoc with the battle group's vehicles and escaped in a stolen 2½-ton truck loaded with mortar ammunition.

A second jump was made under similar conditions. Again the free-fallers landed undetected 300 to 400 yards from a front-line company. They moved into the battle group's command post area where they raised hell with the assault CP. The patrol captured two recon vehicles and a company commander's jeep, and left telltale lipstick marks on a tank without disturbing its sleeping crew. Before rendezvousing with their helicopter the patrol cut most of the communications lines leading into the battle group's area.

A third test was made at Camp Breckinridge, in completely unfamiliar terrain. Five men dived into the general area of a battle group's CP to cause considerable damage and confusion. Only one, who landed in an occupied foxhole, was captured before he could get free of his chute.

During the Army Training Test units of the 101st now display some little nervousness since the advent of this silent enemy from the skies. Many even post skywatchers in an attempt to protect themselves against silent infiltration.

So much for the expert free-fallers, some of whom have made more than 20 jumps with combat equipment. Why not so train other troopers so they will know what to do if picked for a special mission?

The task is not as difficult as one would imagine. The Fort Campbell club has developed a workable training program for the unskilled as well as for its expert members. A small experienced cadre can handle 30 troopers of the type that might be selected for a dangerous but important mission—intelligent and aggressive soldiers with good mental coordination and physical condition. In 21 days, making two jumps a day, troopers can be trained to free-fall at night with combat equipment from 20,000 feet. The club has experimented with a somewhat relaxed program of 37 jumps, ending with 40-second "delay" jumps. Trainers found that some students learn much faster than others, but that men already accustomed to normal parachuting are much easier to teach.

The military free-faller needs little special equipment: goggles, a luminous-dial altimeter, and a crash helmet.

Fort Campbell's troopers of the free-fall club have shown that the scheme is practicable. We should look a little closer into this glamorous and popular sport of sky diving. It is not just another pastime for hot-rodders or playboys. There are military applications of this means of infiltration that do not readily meet the eye—especially in the enemy's rear area.

Before a tactical jump, Fort Campbell sky divers are briefed by their leader

International Logistics

First strategy, then tactics, and now logistics have been integrated within our NATO Shield Forces

ALAN JENSEN

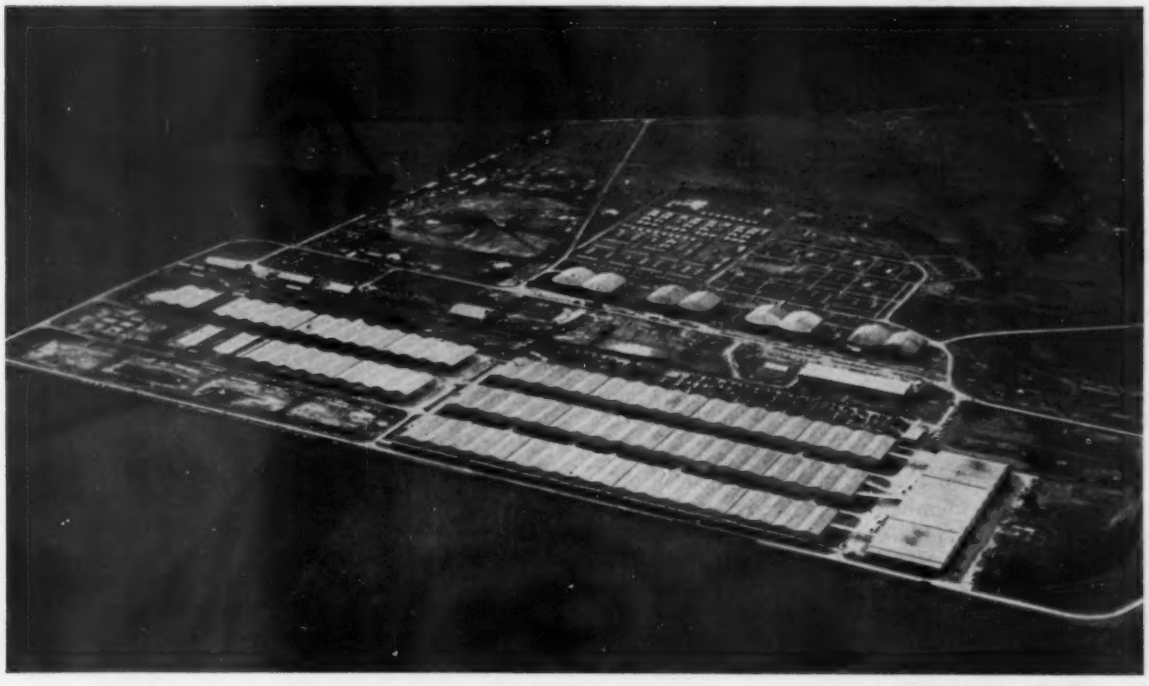
THE initial step has been taken in the final phase to place logistics on an international scale by establishing the first NATO supply depot at Chateauroux, France. Just two years after the NATO Maintenance Supply Services Agency began operations, it has progressed to where spare parts may now be drawn from a central warehouse.

Since the founding of NATO in 1949, leaders of member nations have hoped for nearly complete integration of military units. The first shift to the international level was in the field of strategy, followed by tactics. In April 1958, plans were made to place logistics in the same bracket. The NATO Maintenance Supply Services Agency was given the task of getting countries to cooperate on supply matters in the international market. Its direction was turned over to Brigadier General Charles A. Heim, USAF, who was familiar with supply problems from having directed USAF Air Materiel Command centers.

Coordination through NAMSSA

The Agency, designated by the abbreviation NAMSSA, was established on the premise that while logistics remains entirely a national operation, certain of its segments can be handled on an international level. That level has been reached through standardization and common use of some military equipment within NATO, thereby including more than one member having the same or very similar supply, maintenance and procurement problems. NAMSSA was established to eliminate duplication of effort and to bring about cash savings by having a logistics clearing house which could coordinate operations. All members

Sprawling warehouses at Chateauroux, France, house NATO Maintenance Supply Agency



of NATO, with the exception of Canada and Iceland, agreed to join and support the Agency.

As a starting point, the Agency's charter suggested that operations be confined to supply, maintenance and procurement problems of 15 vehicles and five aircraft, all manufactured by the United States and supplied to most NATO countries through various grants, aids, sales and assistance plans. Most of the vehicles selected were of World War II design, while the planes were early-model jets and older-model transports. The plans recommended that the Agency attempt to coordinate maintenance programs, combine purchases of spare parts, and arrange for excess spares to be transferred from one country to others in need of them. Future operations were to be inaugurated as need arose and as the Agency became experienced with the mechanisms of international logistics. Upon implementation only one major error was discovered in the proposed plan of operation. For the Maintenance Division, few problems existed. None could be put on an international basis since the members had worked with the selected vehicles and planes for so long that relatively efficient, rapid and cheap maintenance was already being performed. Maintenance officials immediately realized that the area in which they could be most efficient was in providing help for equipment new to each country.

The first of the Agency's two years of life was devoted almost entirely to organization, gathering information, and informing members about what services were available. By the final six months of 1959, all branches of the Agency were functioning and it was rapidly moving towards its goal of becoming self-sustaining.

The exchange plan for spare parts

Since the founding, the Supply Division has been responsible for engineering transfers of spare parts from a country with excess stocks to others with shortages. When it was begun, that redistribution project, under the direction of Air Commodore Walter Stagg, was confined to the 15 vehicles and five aircraft already mentioned. Commodore Stagg, who had served with all three branches of the British forces before finally settling with the RAF as its supply director, has expanded the redistribution project to include newer vehicles such as the M47 tank and the M44 self-propelled gun.

In starting the redistribution project, a selected list of spare parts was prepared for each of the 15 vehicles. Members were asked to determine whether a surplus of those parts was available for transfer to other NATO members or a shortage existed which could be filled from another country's excess stocks. The replies, which took several months to obtain, indicated that seven countries had both excesses and shortages. An eighth, Greece, reported only a shortage of vehicle spare parts. In the exchange plan, approximately 10,000 articles valued at more than $4 million were traded. Greece, Portugal and Turkey each received spare parts worth more than $1 million. The largest amount of excesses, worth nearly $2 million, was contributed by Norway.

Shortly after the vehicle spares list was distributed, a similar one was compiled for four aircraft, the T-33, F-84, F-86 and C-119. The fifth, the C-47, was determined to have no parts which would fit into the plan. So far not all returns from members are in, but the Division's officials are confident an exchange will soon be effected.

Although the Agency had not planned on working with spares for the M47 tank, several members asked if excesses were available from other countries. As a result of the Division's queries, an exchange was arranged among Turkey, Italy, France and Greece. Three-quarters of a million dollars worth of spares were shifted among the four nations.

Commodore Stagg points out that the greatest difficulty in making transfers lies in the Agency's failure to get replies to its questionnaires. So far, deadlines for replies have been extended to almost twice the time estimated as necessary. One difficulty is that each member has its own system for posting the information requested by the Agency. Whenever possible, the Agency transfers these data to electronic punched cards and asks for replies to be rendered in the same manner. A few

Official title of bearded Frenchman is technical associate to the director of depot operations

Retired French General N. Bisson, chief of depot operations, and U. S. Army Captain E. L. Bennett of the depot's materiel processing branch

members have converted completely to punched card records while others have partially converted. Greece, Italy, Luxembourg and Turkey, though, have no system that can be carded and so must obtain and supply the details by other means.

A management consultant group

Commodore Stagg considers his Supply Division a type of management consultant group. "We have brains to sell here. We can contribute a considerable amount of experience. Most of our men are experts in their field of supply."

While the practical work that has produced tangible results has been accomplished by the Redistribution Branch of the Supply Division, Commodore Stagg points out that the future lies with the Requirements Branch. "It's in that field that the really exciting work will be found," he said.

The first substantial work the Agency has performed in that area is directly concerned with Forward Scatter, a radio communications system embracing 42 stations located in nearly all of NATO's European countries. SHAPE officials assigned Forward Scatter logistics problems to the Agency, and the Supply Division is presently engaged in solving them.

"What we have to do," outlined Commodore Stagg, "is determine where supply points will be located and what level of stocks will be kept at each of them. Many factors have to be considered. For example, weather, and transportation difficulties, may require more supply points in the Norway region than, for instance, France. Also, the levels of stocks may be entirely different for each of the depots. We will decide approximately where the depots should be placed and what the stock level will be. Later on, we will survey and make adjustments of the stock levels."

In still another field, Supply officials are trying to develop plans whereby Germany, Greece and Turkey can maintain common stocks of spares for the NATO-approved, lightweight strike-reconnaissance plane designed by Fiat and built in Italy. They are trying to encourage Italian authorities to join in the group, since Italy's air force will be equipped with the plane too. Certain problems have yet to be solved. One is that the Italian Government is reluctant to store Italian-made spares at a NATO supply depot outside the country, to have them returned to Italy only when they are needed. So far, SHAPE has detailed to the Agency the task of identifying and stamping all the component parts of the plane with NATO stock numbers. SHAPE is also determining the list of spares that will comprise the kit to be supplied each member that orders the planes.

With the acquisition of Chateauroux, the Supply Division now faces the job of stocking and issuing parts. Two areas are being serviced by the Chateauroux installation. First, the United States has made available a large stock of spare parts for the original five aircraft types. The Agency will gain experience through this limited beginning, and eventually will assume complete control. It will stock as many aircraft parts as is feasible, and provide support for newer model planes and military equipment. The second area at Chateauroux to go to the Agency is the U. S. Army's inventory control point for missiles and rockets. Once experience confirms the advantages of centralized stockage, an almost complete inventory of spares will be kept for NATO's common missiles and rockets.

The Procurement Division

The second major division, Procurement, is being directed by Colonel Francesco Fassio, of the Italian Air Force. It too has expanded greatly since the Agency acquired the Chateauroux depot. At the inception of the Agency, the Procurement Division was interested solely in obtaining bids and placing orders for one or more members which came to it with problems. Now, it has the task of obtaining bids and placing orders for spares which will be stocked at Chateauroux and sold to members as needs arise.

During the first 18 months of operation, Procurement officials placed directly some $10 million in orders for the 13 nations backing the Agency. Several millions more are waiting to be accepted by requesting governments. The amount of business has jumped considerably since mid-1959

when only eight small contracts had been placed through the Agency.

Basically, the Procurement Division is split into two sections. One is responsible for getting names and qualifications of all suppliers in NATO countries; the second negotiates contracts for the various armies and air forces.

Realizing that many firms possess the potential to produce a spare part or to perform maintenance work on a piece of equipment, the Procurement Division faces the problem of determining which of all the suppliers presents the fewest obstacles in working out a contract and filling the order. One step taken by the Division was to ask all known suppliers for details concerning a selected list of vehicles and planes. The letter included a list of nine stages of production or overhaul, any one of which if met by the firm, meant that it would be considered a capable supplier for future contracts. The list of the Agency's prerequisites requires that the firm either have manufactured or overhauled the article in question, or that license rights, drawings, tools and trained technicians are available for manufacture or repair.

"We feel that if a company has progressed to any of those stages, it is capable of being considered as a supplier for the Agency," Colonel Fassio explained. "If it has not, too many complications can arise. Delays and costs may be too great in getting the drawings, license rights, and overcoming the multitude of details which occur before actual work commences."

The problem of contracts

Besides compiling a roster of potential suppliers, Division officials have adopted a universal contract that covers the terms and conditions under which bids shall be made and accepted. Efforts are being made to hold conditioning clauses to a minimum, so that both suppliers and members may benefit from lower costs.

Colonel Fassio pointed out that some members have added numerous conditioning clauses to their contracts. As a result, some suppliers are reluctant to agree to such terms because of too many ifs, ands and buts, all of which tend to boost production costs and ultimately the final price. "Contractors who do sign such documents," he said, "usually ignore many of the clauses, knowing them to be irrelevant."

Whenever an inquiry is forwarded to the Procurement Division by the Supply Division, requests for bids and copies of the contract are sent to all qualified firms. These requests are rarely for a definite amount of work; rather, they ask for prices on a sliding scale based upon the quantity finally ordered.

Sealed bids are returned to the Agency and then forwarded to the inquiring member along with the Agency's recommendations. At the same time, copies of the bids go to other members for possible inclusion in the final contract. In one instance, where Italy requested a number of aircraft tires and other NATO members learned of the bid price, several of them joined the contract, thus enlarging the order so as to effect an even lower price per unit.

Not all inquiries forwarded to the Procurement Division result in a contract for business. Danish authorities asked about buying a number of batteries, but Agency officials considered the order so small that it would be cheaper for that government to deal directly with a local supplier than through the Agency. In other instances, before contracts could have been negotiated, the need no longer existed.

Division officials are taking precautions in how they work with the potential suppliers since the Agency helps negotiate millions of dollars worth of business each year.

"When you buy," remarked Colonel Fassio, "you can have no friends. It is not enough that we know we are being fair and honest, but we must also give the impression at all times that we are that way. We are becoming more formal at all times."

The Maintenance Division

It is in the third section of the Agency, the Maintenance Division, where a revision of original plans had to be made before any work could be accomplished. Until now, the major share of requests for help has been "emergency" type and not for aid in developing long-range plans for repair and maintenance of military equipment.

"We accept the emergency calls but that's not our main purpose," explained Colonel Tjalling H. Bakker of the Royal Netherlands Army and director of the Maintenance Division. "We want to do work on a master schedule. We hope to be more successful in the future."

The emergency help supplied by the Division covers such varied articles as trucks from Turkey to recapped tires from Germany. In the long-range operation, one of the more important plans is to establish a master schedule for the repair and calibration of electronic testing equipment.

Agency officials have foreseen the problem of insufficient facilities for checking the accuracy of electronic test instruments that are used in repairing and calibrating highly sensitive equipment. Most members have shops that can do regular repair work, but little has been done to verify the accuracy of the tools and machines employed in effecting the repairs.

According to Lieutenant Colonel Maurice Gouillon, a French Army officer who heads that par-

A civilian employee checks out a shipment to a NATO country. Hundreds of French farmers have acquired skilled jobs since the depot was opened in 1952

ticular program of the Agency, most members have never had their test equipment calibrated since it was put into use several years ago.

Colonel Gouillon is establishing a repair and calibration system for electronic test equipment. Several members have reported to him that all their equipment needs to be calibrated. None have the facilities for doing the work but all are willing to schedule it through the Agency. Plans have been developed for the NATO equipment to be sent to USAF shops at Chateauroux and Madrid. The Agency's plan contemplates the establishment of a shop which will be able to do even the most difficult repair and calibration work.

Two other Maintenance Division functions, which will become more important through the years, are the development of a library of technical manuals and maintenance publications and the establishment of a source file of each member's maintenance capabilities. The library will attempt to include publications relevant to all equipment common to two or more NATO members and will be available to all members of the Agency.

The source file will permit the Agency's officials to know at all times where work can be done either on a schedule or in emergencies. It was through the process of gathering that information that Agency officials discovered Turkish authorities were having trouble repairing certain assemblies of World War II vehicles. Through the Agency, the Turkish Government has arranged to have the work performed outside the country.

Control of quality

Anticipation of future needs caused Maintenance officials to query members about the overhaul capabilities and requirements for the J-57 jet engine used in F-100 fighter-bombers. They realized that most NATO air forces flying the North American Supersabre soon will be facing major overhaul problems.

So far, the project has progressed to the point where France, Portugal and the United Kingdom have offered reconditioning services for the engines. Denmark is the first member to present an exact program of overhaul on its engines. Although the plans have not advanced to the point where contracts are being let for repairs, it is expected that most NATO air forces will combine to have the work done through the Agency.

One difficulty which must be overcome when several members combine orders is that of insuring quality control acceptable to all nations. Actual inspection work on each maintenance job will

be done by the country in which the work is being performed. A common set of standards will be established to which all members will adhere.

Colonel Bakker believes the quality control problem will be quickly solved. "It's not a difficult job in making a set of standards. Most countries have fairly similar acceptance standards now, only adjustments have to be worked out. A precedent for other countries making acceptance of work has already been established. In the offshore procurement program of the U. S., work was inspected and accepted by the host country and not the country eventually receiving the equipment."

Financing procedures

One key to the future of the Agency is in the hands of the Finance Division, since a founding principle is that the Agency will become self-supporting as soon as practicable. Although the charter has not set a time limit for attaining that goal, officials are confident that the goal will be reached soon.

Means for financing the Agency have been studied extensively by its officials and by the Board of Directors. Two plans have resulted. The first calls for the Agency to be supported entirely from a five per cent surcharge to be collected on each sale or contract made through the Agency. The second idea is for the Agency to depend almost entirely on the five per cent collection but also to require each member to pay a yearly subscription in addition; the subscription to be refunded during the year from the surcharge on sales and contracts.

One reason for demanding the yearly fee is to make each member pay for its voice in governing the Agency's affairs. A second theory is that once a member has paid a fee to support the Agency, it will be more apt to actively participate by having the Agency work for it.

The budget for 1960 which was approved by the Board of Directors called for the Agency to spend nearly $800,000 for operations at the main headquarters in Paris. Operations at Chateauroux, it was estimated, will cost the Agency an additional $2.5 million for the first year.

Funds to meet Agency obligations are obtained from four sources. Until recently, the most important means has been direct contributions from the 13 members. The United States contributes 25 per cent, while France, Germany and the United Kingdom each give 20 per cent. Six per cent is paid by Italy and three per cent by the Netherlands. The final six per cent is paid by the seven smaller nations that participate in the Agency.

Now, the most important means of support will come from the surcharges. Even during the first year, roughly $200,000 was collected in outside sources, mostly from surcharges. The third source, rather small until now, comes from SHAPE for the Agency's part in establishing and maintaining the supply system for Forward Scatter and similar NATO projects under direct SHAPE jurisdiction.

The final source is a temporary one in the form of a $25 million line credit offered by the United States. This fund was made available to pay for contracts made by members. As the members repay what was borrowed from the U.S. it will be retained by the Agency for a couple of years before the full amount will have to be reimbursed to the U.S.

Staffing the international group

Staffing the international group has not presented any particular problem since there are many highly qualified and interested applicants. For all practical purposes, the Agency has finished the major share of its growth although some people may be hired as required as new projects are introduced. At least two persons from each of the 13 member nations are working for the Agency.

Except for U.S. employees, everyone is paid in French francs. At the time the Agency was formed, the United States Government exercised the right to pay its citizens and be reimbursed by the Agency. Such action allows the U.S. to collect income tax, a cost avoided by citizens of other nations, including the French who work for the Agency.

Although the U.S. is backing the Agency, it has been unable to do much business through it. Most supply channels for the Army and Air Force are established in the continental limits of the United States and not overseas. Also, the maintenance, repair and supply of the military forces in Europe represent only a portion of the American services.

One service has not yet profited from the Agency's work. The navies of NATO have not asked for help or been offered any service by Agency programs. Captain Alfred Magnell, the only U.S. Navy member on the Agency staff, pointed out that the diverse different equipment of most navies eliminated them from the early stages of the Agency's programs. As procedures with Army and Air Force equipment become less complicated, the Agency will be able to explore the possibilities of aiding in problems of naval supply and maintenance. Most of NATO's navies are equipped with minesweepers of similar types and patrol craft constructed under various military aid and offshore procurement programs. Agency officials expect that problems along these lines will be common to more than one member and ripe for Agency assistance.

La Guerra de Guerrillas

Continuing our condensation of Che Guevara's book on the lessons learned by Castro's rebel forces

Chapter II. Bush Warfare

The Guerrilla as a Fighter

Idealistic, implacable, nocturnal and preferably a native of the area, the guerrilla fighter must make maximum use of surprise, weapons, terrain and his physical stamina to combat and conquer conventional forces.

The first question which arises is, "What should the guerrilla fighter be like?" One must reply that preferably the guerrilla fighter should be an inhabitant of the area. There he has friends to whom he can turn for help. He will know the area because it is his. This personal knowledge of the terrain is an important factor in guerrilla warfare.

The guerrilla is a nocturnal fighter. This means he must have all the attributes required for night operations. He must be cunning; he must march to the battlefield over hills and dales so that no one becomes aware of his presence; and having the benefit of the factor of surprise he must fall upon the enemy. He must immediately exploit the panic which all surprises cause and throw himself violently into the struggle. He must allow no weakness on the part of his companions, and he must immediately correct any indication of weakness should it arise. He must fall upon the enemy like a typhoon, destroying everything, giving no quarter and expecting none if the tactical circumstances make this necessary. He must mete out justice to those who are to be tried and sow panic among the enemy. However, at the same time, he must treat benevolently the defenseless vanquished and also respect those that die.

A wounded soldier must be given medical treatment and must be given the best possible help unless his earlier life makes him subject to punishment by the death penalty. In this case, he

Never impatient, successful guerrillas await opportunity. An off day in Oriente province gave Fidel Castro a chance to catch up on his reading, possibly the justly celebrated exegesis on guerrilla warfare by Mao Tse-tung

will be treated in accordance with his past. One must never take a prisoner unless he can be brought to a solid base of operations impregnable to the enemy. Unless he is a well-known criminal, a prisoner is to be set free after he has been interrogated.

The guerrilla fighter must be ready to risk his life as often as necessary or to give it without the slightest hesitation at the required moment. But, at the same time, he must be cautious and never expose himself unnecessarily. All necessary precautions must be taken to prevent an adverse conclusion of any operation or battle. That is why it is so very important that, in any battle, total vigilance be exercised over areas from which enemy reinforcements can arrive, and also to prevent a siege. The consequences of a siege [1] are grave not only with respect to the physical disaster they can cause, but also with respect to the moral disaster which may bring a loss of faith in the outcome of the struggle.

Without reservation, there must be audacity. The dangers and the possibilities of an action must be correctly analyzed. There must always be readiness to take an optimistic attitude towards circumstances and to seek a favorable decision even when an analysis of the advantages and disadvantages may not warrant it.

If the guerrilla is to survive amid the conditions of the struggle and the actions of the enemy, he must have a quality of adaptability which will permit him to identify himself with the environment in which he lives. He must adapt himself to it as his ally and exploit it as much as possible. At the same time, he must have a quick imagination and instantaneous resourcefulness which will permit him to change the course of events by using a decisive course of action.

A guerrilla must never leave a wounded companion to the mercy of any enemy because it is virtually certain that his fate will be death. Regardless of the difficulty, he must evacuate the wounded from the combat zone to a safe place.

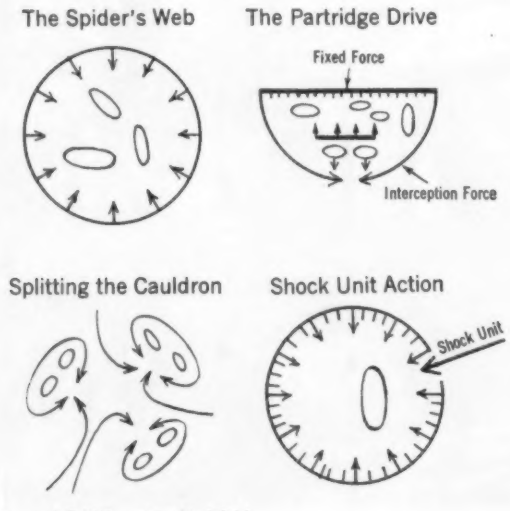
At the same time, he must be tight-lipped. Everything that is said or is heard in his presence must always be strictly reserved to his own knowledge, and he must never permit himself to utter one single word too many. This must even be the case among his own fellow fighters: obviously, the enemy will try to infiltrate agents into the guerrilla force in order to learn the plans, places, and means of existence available to and utilized by the guerrillas.

In addition to the moral qualities we have stressed, the guerrilla must possess some very important physical qualities. The guerrilla fighter must be untiring. There will be times when he will have to go to a still more distant place when his exhaustion appears intolerable. He must always have a radiating face and manifest the deepest of convictions. This will allow him to take still another step, still do his utmost, and follow it up with another, and another, and another until he arrives at the place designated by his leaders.

He must be long-suffering to the most extreme degree in order to overcome the privations of hunger, thirst, and lack of clothing and shelter to which he is exposed at all times. He must also be able to withstand illnesses and wounds which many times will have to be cured without major medical care. His only doctor may be Nature's healing action. It *must* be this way, because the fighter who leaves the battle zone in order to seek medical help for some illness or wound is, in most cases, executed by the enemy.

Persons with such notable characteristics of devotion and firmness must have an ideal which permits them to be effective under the adverse conditions we have described. Such an ideal must be simple, not complex, without great pretention, and in general need not be profound. But it must be so firm and clear that without the slightest hesitation a man will give his life for the ideal. Among nearly all farmers such an ideal is the right to have a piece of land for himself in order that he may work it and enjoy the fruits of just social treatment. Among the workers such an ideal is to have work, to be paid an adequate wage, and also to receive just social treatment.

[1] Throughout this work the fear of a "siege" is apparent. Actually, Guevara means encirclement. Mao also acknowledges that the encirclement is the thing to be most feared. German experience in Russia also indicated that the only really effective way of stamping out guerrilla activity was by encircling the affected area and completely exterminating the guerrilla band. For a description of German methods and the directive they issued to combat guerrilla groups see Dixon, *Communist Guerrilla Warfare* (Frederick A. Praeger, New York, 1954), 201-223. In capsule form, the German concept is given below. The Germans designated a guerrilla area as a "cauldron" and gave these four basic methods for destroying a cauldron by encirclement:



Among students and professionals, more abstract ideals are found such as those of freedom, for which they fight.

All this leads us to ask how a guerrilla fighter lives. His normal pattern of life is the hike. Let us use as example a guerrilla fighter in the mountains situated in wooded regions, who lives under constant harassment by the enemy. Under such conditions, in order to change position, a guerrilla moves without stopping to eat during daylight. When darkness has fallen, an encampment is established in some clearing near some water course. Each group eats together and campfires are made from materials at hand.

The guerrilla fighter eats when he can, and all that he can. Sometimes fabulous amounts of rations disappear in the gullets of the fighters, while at others two or three days of fasting occur.

Under the conditions described, encampments must be easily movable, and no traces left which will give them away. Vigilance must be extreme: for every 10 men that sleep, one or two must be on watch. Sentinels must be continually relieved and all entrances to the encampment must always be under observation.

Within the pattern of the life of the fighter, combat is the most interesting event. It brings to all the greatest joy and makes them march with renewed spirit. Combat, the climax of the guerrilla's life, takes place at suitable moments when some enemy encampment has been found, investigated, and determined to be so weak that it can be annihilated. Alternatively, an enemy column may advance into the territory immediately occupied by the liberating forces. The two cases are different.

Against an encampment, action will be widespread and will fundamentally attempt to defeat the members of the column that come to break the siege, inasmuch as an entrenched enemy is never the favorite prey of the guerrilla. The ideal prey is the enemy in movement—nervous, lacking knowledge of the terrain, fearing everything, without natural protection for self-defense. An unfavorable condition exists when the enemy is entrenched and has powerful arms to repel attack. However, this is never the situation when a large column is suddenly attacked in two or three places and fragmented. Then the attackers can withdraw before any reaction can take place, because they cannot surround and completely destroy the enemy columns.

If it is not possible to rout the enemy through hunger or thirst or through a direct attack of those who are entrenched in the encampment, then the siege should be lifted after it has inflicted its destructive impact on the invading column. In cases where the guerrilla force is too weak and the invading column is too strong, action might be centered upon the advance guard. There are some who have a special predilection for this operation, whatever other result they may wish to achieve, and time after time they attack the same advance position. The enemy soldiers then come to the realization that those in the front places almost invariably are killed, and they refuse to occupy the advance positions. Thus, real mutinies are provoked. The advance guard must always be hit again, even though other points of the column might also be attacked.[2]

The degree of ease with which the guerrilla fighter can accomplish his mission and adapt himself to his environment depends upon his equipment. The guerrilla fighter has individual charactertistics, even though he is attached to the small units that form his group of action. He must keep in his knapsack, in addition to his usual equipment, all the necessaries which will enable him to remain alone for some time.

In giving the list of equipment, we refer essentially to that which a fighter can carry in th situations existing at the beginning of the war, in difficult terrain, during frequent rains, in relative cold, and when being pursued by the enemy. In other words, we refer to the situation that existed at the beginning of the Cuban War of Liberation.

The equipment of a guerrilla fighter is divided into essentials and accessories. Among the first is the hammock which allows him to rest adequately. He will always be able to find two trees from which he can suspend it. In case he should

[2] This is a favorite tactic evidently devised by Guevara himself. It is mentioned repeatedly and is an excellent example of psychological warfare of a rather unusual sort.

have to sleep on the ground, the hammock can serve as a mattress. In case there is rain or when the soil is wet—a frequent event in the tropical mountain zone—the hammock is indispensable in order to be able to sleep if a piece of nylon waterproof cloth is used with it. Nylon can be stretched to form a roof to cover the hammock: a string is attached at each of the four corners, the middle resting on another length of string. The last string serves to divide the waters, and thus a small campaign tent is formed.

A blanket is indispensable because during the night it gets very cold in the mountains. It is also necessary to carry some cover which permits one to face the great changes in temperature. Dress consists of work shirt and work trousers, be they uniform or not. The shoes must be of best possible construction, and one of the most important articles of which one should have a reserve are shoes: without them marching is very difficult.

Inasmuch as the guerrilla fighter carries his movable house in his knapsack, his knapsack is also very important. Primitive ones can be made from any bag to which are attached rope handles; but better ones are made of leather and can be purchased or can be made by some leather worker.

The guerrilla fighter should always carry some personal food supply in reserve, in addition to that issued to the troops or eaten during rest stops.

The following are indispensable: butter or oil are the most important because they furnish the fats required by the body; canned goods that must not be consumed except in circumstances when it is not materially possible to obtain food for cooking, unless there are so many cans their weight hinders the march; canned fish, of great nutritive value; condensed milk, an excellent food because of the quantity of sugar it contains and for the taste which gives it the character of a treat; powdered milk, which is always useful; sugar is another important part of the equipment; so is salt, which makes hardship more bearable. Also useful are seasonings for food. The most common are onions and garlic, though there are others which vary according to the characteristics of the country.

To care for his rifle, the guerrilla needs special greases which must be very carefully applied—sewing machine oil is quite good if special grease is not available. Scraps and bits of cloth will be useful in caring for weapons as well as a little pail in which he can clean them, for this must be done quite often. The cartridge belt should be of standard manufacture, or else home-made according to the circumstances; but it must be sufficiently good so that not a single round is lost. Bullets are the basis of the struggle. They must be guarded like gold for without them all else is in vain.

The guerrilla must carry a canteen or a water flask because he must drink in quantity and it is not always possible to find water when it is needed. He must carry general purpose medicines such as penicillin or other antibiotics, drugs such as aspirin to treat fever and those for the endemic illnesses of the locality. These might be tablets against malaria, sulfa drugs against diarrhea, antiparasite agents of various kinds—in other words, the medical supply must be adjusted to the characteristics of the area. All drugs should be well packed and of the oral type whenever possible. In places where there are poisonous animals it is well to carry the antidote serum. The rest of the medical equipment must be surgical. In addition, there might be small individual supplies of drugs for treating minor ailments.

Very important in the life of a fighter are cigars, cigarettes, or pipe tobacco, for the smoke that can be enjoyed during moments of rest is a great boon to the solitary soldier. A pipe is best, for it allows the fullest use, in times of shortages, of the tobacco of cigarettes and cigar butts. Matches are important not only in order to light cigarettes but also to light fires. Fires are one of the greatest needs of life in the mountains during rains. It is preferable to carry both matches and a lighter so that if one fails the other can be used.

It is convenient to carry soap, not only for personal cleanliness but also to clean eating utensils. Intestinal disorders are frequently caused by spoiled food which is mixed with new food in a dirty utensil. With all the described equipment, a guerrilla fighter can feel secure enough to survive in the mountains under any adverse condition for the time necessary to master the situation.

There are accessories which at times are useful and at other times constitute a hindrance but which, in general, are very useful. The compass is one. In any given zone, the compass is used mostly as a complement to orientation because increasing familiarity with the terrain makes that instrument unnecessary. Furthermore, the compass is very difficult to use in mountainous terrain because the route it indicates frequently is not the ideal one to move from one place to another. The straight route is likely to be interrupted by insurmountable obstacles. Also useful is an extra piece of nylon cloth in order to cover equipment during a rain. It must be stressed that in tropical countries rain is very constant during certain months and that water is the enemy of the warrior's equipment, his food, his weapons, his medicines, his papers, or his garments. A change of clothing may be carried, but usually this is something new recruits already have. Usually only a pair of slacks and underwear are carried

and other articles such as towels omitted. The life of a guerrilla fighter teaches safeguarding energy to carry the knapsack from one place to another and rejects everything which is not essential.

The prerequisites of cleanliness are a piece of soap which will serve for washing of belongings as well as for personal cleanliness, and tooth brush and paste. It is also advisable to carry some books which can be exchanged among other members of the force. The books should be good biographies of heroes of the past, histories or economic geographies (preferably about the country), and some general works which will tend to raise the cultural level of the soldiers. These lessen the tendency to card games and other forms of distraction which sometimes loom too large in the life of the guerrilla fighter.

Whenever there is extra space in the knapsack, it should be filled with articles of food, except in areas which offer very advantageous conditions for food supply. Candy or foods of lesser importance might be carried to augment the basic diet. Hard biscuits might be among these, but they occupy much space and they easily crumble. In the mountains, it is useful to carry a machete. In more humid places, it is useful to have a small bottle of gasoline or to obtain some resinous ma-

terial from pine trees which will permit quick starting of a fire even though the wood is wet.

Among the usual equipment of the guerrilla fighter must be a pencil and notebook to enable him to make notes, to write letters to the outside, or to communicate with other guerrillas. He should always carry a sewing kit.

A guerrilla who carries all these articles will have a solid house on his shoulders—a considerable weight, but adequate to make his life more comfortable amid the hard work of the campaign.

Organization for Bush Warfare

> Flexibility is foremost in the guerrilla leader's mind. Just as the conventional forces commander must be ready to change his tactics—so must the unconventional leader be prepared to reverse his field to stay with the situation.

The organization of a bush war cannot be described as following a rigid scheme.[3] There are innumerable differences resulting from adaptation to the environment to which the principles apply. For reasons of exposition, we shall assume that our experience has universal value. However, we must stress that as we explain it, there always exists the possibility that new ways of doing things can be found which are more suited to the characteristics of the particular armed group.

The number of units in a guerrilla force is one of the most difficult problems to define. There are different numbers of men, different organizations of troops, as we have experienced. We shall suppose a force located in favorable, mountainous territory under conditions that are not so bad as to force them to move continually, but not so good as to enable them to have a permanent base of operations. An armed nucleus located in such a setting should not have as its tactical unit more than 150 men. It may even be that this number is too many and the ideal might be 100 men. This constitutes a column, and it is commanded, following the Cuban military hierarchy, by a major *(comandante)*. It may be well to repeat that in our war we abolished the ranks of corporal and sergeant because we considered these to be representatives of tyranny.[4]

Basing ourselves on these premises, a major commands a force of 100 to 150 men and has as many captains under him as there are groups of 30 to 40 men. The captain leads and organizes his platoon so that it fights almost always as a unit, and he is in charge of the distribution of supplies and the general organization of the units. In guerrilla warfare, the squad is the functional

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[3] Mao, *op. cit.*, 154: "The principle of command in guerrilla war is opposed both to absolute centralization and to absolute decentralization; it demands a centralized command in strategy and a decentralized command in campaigns and battles."

[4] Some readers may recall that Batista was a first sergeant in the Cuban Army before he seized power.

unit. Each squad has approximately eight to 12 men and is commanded by a lieutenant who has duties analogous to those of a captain for his group, but who is always subordinated to his captain.

The operational reality of guerrilla warfare, which is waged in small groups, makes the squad the real unit. Eight to 10 men are the most that can act together in a fight under such conditions. Therefore the lesser groups must execute the orders of their immediate chief often while separated from the captain although active on the same front. One thing that must never be done is to fragment the unit and to maintain it as such at times when there is no fight. For every squad and platoon, the immediate successor must have been named in case the chief is killed; the successor must be sufficiently trained to be able to take immediate charge of his new responsibility.

One of the fundamental problems of this troop concerns food: lowest-ranking men must receive the same treatment as the chief. This is of prime importance not only with respect to chronic malnutrition, but also because the distribution of food is the only regular daily occurrence. The troop is very sensitive to justice and measures all rations in a critical spirit. Never, therefore, must the least degree of favoritism influence anything. If for any reason the food is distributed among the entire column, some order must be established and must be strictly respected. At the same time the quantity and quality of food allocated to every person must be specified.

In the distribution of clothing, the problem is different because here are articles of individual use. Two criteria must be considered. First, the claimant's need. Second, the system of seniority and merit. This is difficult to define and must be set down in special charts by someone entrusted with them and approved by the chief of the column. The same procedure must be followed with all other articles which may arrive and which are not for collective use.

Tobacco and cigarettes must be distributed according to the general rule of equal treatment for everyone.

The task of distribution must be handled by persons who are especially entrusted with it. It is advisable that these be part of headquarters. Indeed, headquarters has very important administrative tasks of coordination, and other tasks should normally be given to it. The most intelligent officers should be part of headquarters, and its soldiers should be diligent and imbued with the highest spirit of devotion, inasmuch as the demands made of them will, in most cases, be greater than those made of the rest of the troops. However, in matters of food they have no right to any special treatment.

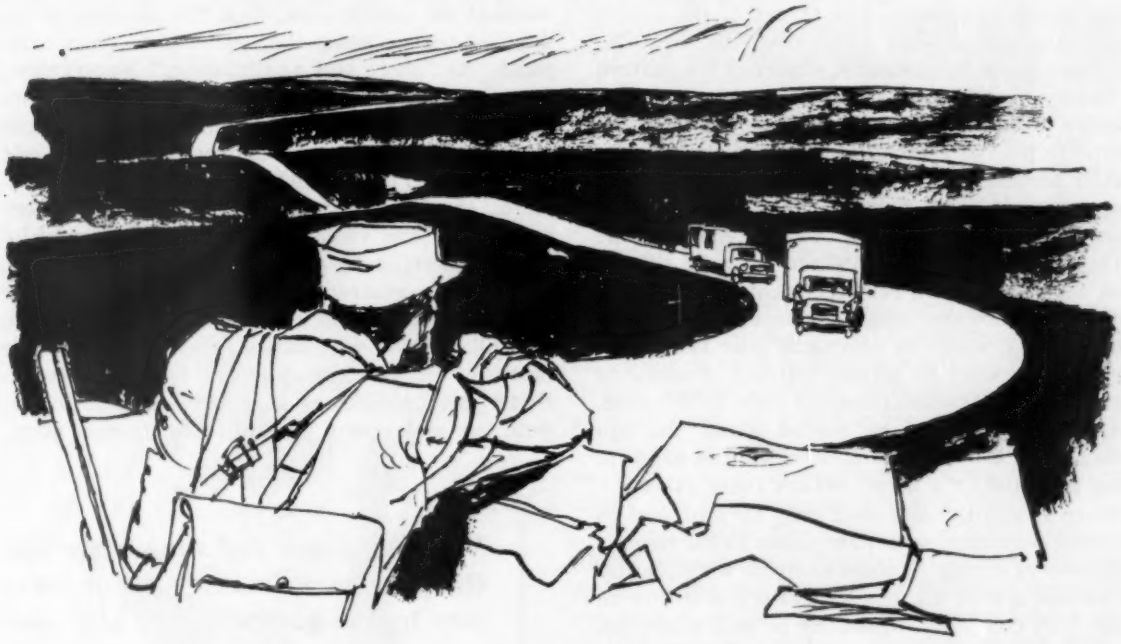
Every guerrilla fighter carries his own complete equipment, but there are a number of articles of special social importance to the column which must be fairly distributed. For these two criteria may be established, depending on the numbers of unarmed persons in the troop. One solution is to distribute all the objects such as medical supplies, extra food, clothing, general surplus foods, and heavy weapons equally among all platoons. Each platoon would then be responsible for the custody of the material assigned to it. Every captain would distribute the goods among the squads and each squad leader would distribute them among his men. Another solution when there are unarmed men in the troops, is to form squads or platoons especially entrusted with the transportation of these supplies. Using these men will be very beneficial, since it unburdens the combat soldier while those who are unarmed do not have the weight or the responsibility of the rifle. In this manner, the danger of losing supplies is reduced; in addition, they are more concentrated. At the same time, this arrangement constitutes an incentive for the porters to carry more and to demonstrate more enthusiasm because one of the rewards may be the opportunity to carry a rifle in the future. Such platoons should march last in the column and should have the same duties and receive the same treatment as the rest of the troops.

The tasks to be executed by a column vary with its activities. If it remains permanently in the encampment, it must have special security teams. Seasoned, specialized troops should be detailed to this task which should entitle them to some premium. This, in general, might consist of some independence or in some surplus delicacies or tobacco to be distributed among members of units which have extraordinary tasks. Of course, these supplies must have been initially distributed to the entire column. For example, if there are 100 men and 115 packages of cigarettes, these 15 extra packages could be distributed among the members of the units to which I have referred. The vanguard and the rear guard, distinct from the rest, will have as their duty the primary responsibility for security. Nevertheless, each platoon must keep up its own. The more that areas distant from the encampment are kept under surveillance—if the camp is in open space—the greater the security of the group.

The places selected must be at some altitude; they must command a wide area by day and be difficult to approach at night. If several days are to be spent there, it is convenient to establish defensive works which allow and sustain adequate fire in case of attack. These defenses may be destroyed as the guerrillas withdraw from the site. If circumstances do not require the absolute

obliteration of the column's tracks, they may simply be abandoned.

At sites where permanent encampments are set up, defenses must be clearly and perfectly established. It must be noted that in mountainous areas the mortar is the only effective heavy weapon. Using cover suited to the materials of the area (timber, stones), perfect shelters can be



built which will impede the approach of enemy forces and protect your men from howitzer fire.

It is very important to maintain discipline within the encampment. Discipline must retain educational characteristics. The guerrillas must go to bed and arise at definite hours. They must not be permitted to engage in games which do not have a social function or which have a tendency to impair the morals of the troop. Alcoholic beverages and gambling must be forbidden. Supervision should be entrusted to a commission on internal order elected from among the fighters of greatest revolutionary merit. Among other duties they prevent the kindling of fires visible from a distance at night and betraying columns of smoke during daylight. They also make sure that the encampment is thoroughly policed when the column leaves it, if it is desired to keep secret the halt made at that site.

Much care must be taken with campfires because their traces remain a long time. It may be necessary to cover them with earth and to also bury papers, tin cans, and food waste.

During the march absolute silence must be enforced over the column. Orders are passed along by gestures or whispers from person to person until the last man is reached. If the guerrilla force marches through unfamiliar areas, clearing a path for itself or being guided by someone, the vanguard will precede it by some 100 or 200 meters as dictated by the terrain. In places where confusion may arise as to the route, one man is stationed at each fork in the road to wait for the next group, and so on until the last of the rear guard has been reached. The rear guard will also march separately from the rest of the column to watch the paths left behind and to attempt to conceal the column's tracks. If sidepaths offer danger, there must be a group to watch such paths until the last man has passed. It is most practical that these groups be provided from one special platoon. However, they can also come from each platoon, in which case each group would entrust its mission to the group of the next platoon and return to its place; and so on until the entire troop has passed.

Not only must the march be at a specified pace; it must always be maintained in an established order so that it shall be known that Platoon No. 1 is the vanguard; that Platoon No. 2 comes next; that in the middle is Platoon No. 3 with the headquarters; then follows Platoon No. 4; and finally, that the rear guard is Platoon No. 5. Regardless of the number of platoons in the column, their order must always be maintained. During night marches, silence must be complete

and the ranks closed so that no one loses his way and thereby creates risks from voices being raised or lights being lit. At night light is the guerrilla's enemy.

Of course, if this march has as its object an attack, when the desired place has been reached to which all will return after the mission has been fulfilled, all superfluous equipment (knapsacks, pots, and so on) should be left behind so that each platoon will proceed only with its arms and other battle equipment. The target of the attack must have been studied by trustworthy men who will have made the contacts, observed the pattern of enemy guards, the layout of the position, the number of men defending it, and so on. Then the definitive plan of attack is made, and the fighters station themselves. It must be remembered, however, that a sizable part of the troops must be reserved to engage enemy reinforcements. The enemy's attack on the position may be only a ruse designed to lure reinforcements into an ambush. Therefore, one man must be able to quickly communicate with the command post because it may be necessary to retreat quickly in order to prevent being attacked from the rear. In any case, guards must always be posted along the approaches to the combat area when the siege is being initiated or a direct attack takes place.

When besieging, one need only to wait and to dig trenches which come ever closer to the enemy[5] thus always trying to come to grips with him by all means. Above all, one should try with fire to make him come out. When he is well encircled, the Molotov cocktail is extraordinarily effective. If one is not within range of a cocktail, he can use a shotgun with special attachment. This consists of a 16-gauge sawed-off shotgun to which a pair of supports has been attached in such a manner that with the end of the butt stock they form a tripod. When so prepared, the weapon rests at an angle of about 45 degrees. This can be varied by moving the supports forward or backward. The weapon is loaded with an open cartridge which has been emptied of shot. The cartridge is then perfectly suited to receive a stick which becomes the projectile and protrudes from the mouth of the shotgun barrel. To the protruding end of the stick is attached a tin with a rubber buffer and a gasoline bottle. This apparatus will throw incendiary bottles 100 meters or more and can be aimed rather accurately. It is the ideal weapon for sieges in which the enemy has many fortifications made of wood or inflammable material. It is also good for shooting at tanks in rugged terrain.

Once the siege has ended with a triumph, or has been raised after the objective has been achieved, all the platoons retire in their normal order to pick up their knapsacks and return to normal life.

The organization, fighting ability, heroism and spirit of the guerrilla group will undergo their most crucial test during a siege—the most dangerous situation in a war. In the jargon of our guerrilla fighters during our war, the term "siege anxiety" was applied to the anxious expression some of the scared ones wore. The officials of the deposed regime pompously referred to their campaigns as "siege and annihilation." Nonetheless, for a guerrilla force familiar with the terrain, united ideologically and emotionally with the leader, this is not a serious problem. All that one need do is to take shelter, try to prevent the advance of the enemy, impede his use of heavy equipment, and await the night, the natural ally of the guerrilla fighter. When it becomes dark, then, with greatest silence possible, and after having explored and chosen the best path, the guerrilla force will utilize the best available means of escape while observing complete silence. Under such conditions it is very difficult to impede the escape of a group of men from a siege.

Combat

> Vulnerable are the vanguards and the point men are marked for mayhem by the guerrilla, who also uses encirclement and night attack as morale-breaking maneuvers.

During the first stage of guerrilla warfare, enemy columns will make deep incursions into rebel territory. According to the strengths of these columns, two types of attack can be made. One, systematically carried out over a period of months, will cause the enemy forces to lose their offensive capability. It habitually precedes the other type, and is carried out against the vanguards. Unfavorable terrain will prevent the column from advancing with adequate defense on their flanks. In this manner, there will always be a portion of the vanguard which penetrates and exposes its members as it seeks to assure the security of the rest of the column. The vanguard usually is a small force and cannot count upon reserves. Therefore, no matter how strong the remainder of the enemy's force, the destruction of this tip of the vanguard will always occur. The system is simple and requires only a little coordination. The moment the head of the vanguard appears at the pre-determined place, the attacking guerrilla force must, as suddenly as possible, break through to the designated men and

[5] Oddly enough, for all his disdain for conventional warfare this is the classic seventeenth and eighteenth century method of conducting a siege.

deliver a devastating fire. Then a small group contains the rest of the column for a few moments so that weapons, ammunition, and equipment can be gathered. The guerrilla soldier must always be aware that the enemy is the source of his weapons. Except for special circumstances, he must not wage a battle which is not likely to gain him such equipment.

When the strength of the guerrilla force permits, the enemy column should be completely encircled. At least, this must be the impression

created.[6] In such an instance, the guerrilla vanguard must be so strong and so well entrenched that it can resist a frontal assault. At the instant the enemy is held up in some special place, the guerrilla forces of the rear guard attack his flanks. Inasmuch as the selected place will have characteristics which will make flank maneuvers difficult for the enemy, it will be easy to station snipers who will be able to contain the entire column—perhaps eight or 10 times greater in number—within the circle of fire. When that happens (provided, of course, there are sufficient men), all routes must be blocked in order to deny him any reinforcements. Gradually, the circle must be tightened, especially at night. The guerrilla has faith in the night, but the enemy's fear will increase in the darkness.

In this manner, an enemy column can be totally destroyed with relative ease. Or such heavy losses can be inflicted upon it as to force a return to camp and require much time for regrouping.

When the guerrilla force is very small, and it is desired by all means to detain the enemy column or to slow its advance, groups of sharpshooters should be used. They should number from two to 10 men stationed at each of the four cardinal points around the column. In this manner, the enemy column will be fired upon from the right flank, for instance. When the enemy centers his attention on this flank and attacks it, he will, at that precise moment, be fired upon from the opposite flank. At still another moment, the rear guard will be attacked, or the vanguard, and so on. With a small expenditure of ammunition the enemy can be permanently held in check.

The technique for attacking a convoy or an enemy position must be adapted to suit the conditions or the site selected for combat. Generally, one must be certain that the first attack upon an encircled place will be a surprise during darkness against some advance post.[7] If one has the advantage of surprise, an attack carried out by fearless men can easily liquidate a position. For a regular siege, the escape routes can be controlled with a few men. Moreover, the access routes can be defended with men so dispersed and concealed that if one of them is passed, he can withdraw or simply yield while a second sniper remains, and so on. In situations where the factor of surprise does not exist, success or failure of the attempt to take the encampment will depend on the ability of the besieging force to contain the efforts of the relief columns. In such instances the enemy will usually have the support of artillery, mortars, and airplanes in addition to tanks.

In terrain suitable for guerrilla warfare, the tank is not very formidable. It must pass through narrow paths and is easy prey to mines. In general, the offensive capability which these vehicles have when in formation, loses its value because they must proceed in single file or, at the most,

[6] Mao, *op. cit.*, 130: "Ingenious devices such as making a noise in the east while attacking in the west, appearing now in the south and now in the north, hit-and-run and night action should be constantly employed to mislead, entice and confuse the enemy." In addition, Mao gives a dissertation on the guerrilla view on encirclement.

[7] *Ibid.*, 124: "The basic principle of guerrilla warfare must be one of offensive, and its offensive character is even more pronounced than that of regular warfare; furthermore, such offensive must take the form of surprise attacks. . . ."

two by two. The best and safest weapon against tanks is the mine; but in hand-to-hand fighting so easy to execute in rugged terrain, the Molotov cocktail is of extraordinary value. We have not yet mentioned the bazooka which can be a most decisive weapon for a guerrilla force. However, they are difficult to obtain at least during the early days of a guerrilla war.

A covered trench affords protection against mortar fire. The mortar is a formidable weapon against an encircled force. Conversely, its use against moving targets diminishes its power unless it is used in great numbers. Artillery is not very important in this kind of struggle since it must be sited in places of easy access, and it cannot reach targets which move about. Aircraft are the principal arms of the oppressing forces, but their power of attack is much reduced by the fact that small, concealed trenches are their only targets. They can drop high-explosive bombs or bombs of jellied gasoline, but these are more a nuisance than a real danger. Moreover, whenever one has come as close as possible to the enemy's defensive lines, attacks by enemy aircraft endanger the positions of his vanguard.

A good means of defense against armored cars are steep ditches dug across their path in such a way that the vehicles easily fall into them, but have difficulty coming out. These ditches are easily concealed from the enemy, especially during night marches or when he cannot order infantry to precede the tanks because of the resistance of the guerrilla forces.

Another common form of enemy advance, in areas that are not very rugged, is in trucks that are more or less open. The columns are preceded by some armored vehicles followed by infantry in trucks. According to the strength of the guerrilla force, the entire column can be encircled, or it can be decimated by attacking some of the trucks and simultaneously exploding mines. Then one must act rapidly to gather up the weapons of fallen enemies and withdraw. If conditions allow it, a total siege can be executed.

The shotgun is an excellent weapon for attacking open trucks, and it should be utilized to the fullest extent of its power. The shot pattern of a 16-gauge shotgun loaded with buckshot can cover 10 meters, killing some of the truck's occupants, wounding others, and causing great confusion. Hand grenades are also excellent for such attacks.

Ammunition is the greatest problem of the guerrilla fighter. Weapons can almost always be obtained and kept by the guerrilla force. However, once ammunition is fired, it is gone. Usually, weapons are captured with their ammunition but only very rarely is ammunition alone seized. Not every weapon seized with its own ammunition can contribute to the total supply since there is no reserve stock. The tactical principle of conserving rounds is fundamental in this type of war.

No guerrilla leader, who thinks of himself as such, would neglect the retreat. A retreat must be well timed, nimble, and insure the recovery of all wounded men and equipment, be it knapsacks, ammunition, or other materiel. A rebel must never be surprised while in retreat, nor must he permit the course of the struggle to encircle him.

For all these reasons, the path selected must be watched at all points from which the enemy forces might possibly advance with troops in order to attempt to close a circle. A message system must be established which permits rapid warning to comrades that some force is attempting to encircle them.

During the battle, there should always be unarmed men. These men will recover the rifle of a wounded or fallen comrade, or seize the weapon of a prisoner. They can be put in charge of prisoners, transport the wounded, or carry messages. It is important to have a good group of messengers of proved ability, and with feet of iron, who can forward the necessary messages expeditiously.

There are many variations in the number of men that are required in addition to armed fighters, but they may be reckoned at two or three for every 10 fighters. Among them are some who aid the fight by acting as rear guards, or defending the lines of retreat, or establishing the messenger system.

When a defensive type of war is waged—that is, when the guerrilla force is engaged in preventing an invading column from passing a specific point—then the fight becomes a war of positions. The already mentioned element of surprise must always be sought from the beginning. The entire defensive apparatus must be established in such a manner that the enemy vanguard always falls into an ambush.[8] A very important point to remember is the psychology connected with the fact that in a fight, invariably the enemy in the vanguard are killed. This creates in the opposite army a disinclination to be part of the vanguard. It is obvious that a column which does not have a vanguard cannot move unless someone assumes this responsibility.

It becomes clear that more men and more weapons are required in defense than in offense. It is clear that many soldiers are required to block off all the possible paths—and they can be many—leading to a zone. Here additional use must be made of all traps and means of attack

[8] *Ibid.*, 125: "Gather a big force to strike at an enemy segment, remains one of the principles for field operations in guerrilla warfare."

against armored vehicles; and strict security must be established to protect trench networks. In general, in this type of combat, the order must be given to die in defense; but every defender must be given the greatest chance of survival.

The more concealed a trench is from distant observation, the better. Above all, it is well to cover it with a roof to neutralize the effect of mortars. The shells of mortars used in the field—those of 60 or 81 millimeters—cannot go through a good roof well constructed out of the materials of the area. These may be a layer of wood, earth, or stones covered with some material which hides the roof from the view of the enemy. The shelter must always have an exit which will enable the defender to escape in emergencies without greatly endangering his life.

In this type of war, the work of those not directly concerned with fighting (those who do not carry a weapon) is extremely important. We have already stated several characteristics of communications in places of combat. These communications are a branch within the guerrilla organization. Communication with the farthest headquarters, or with the farthest group of guerrillas, if there is one, must be so established that it is always possible to reach them by the most rapid method known in the region. This is as true in areas easily defended—that is, in terrain suited to guerrilla warfare—as it is in unsuitable terrain. It cannot be expected, for instance, that a guerrilla force fighting in unsuitable terrain would be able to use modern systems of communications. This is because such installations can be of use only to fixed garrisons that can defend such systems.

In all these situations, we have been talking of our own war of liberation. Communications are complemented by daily and correct intelligence concerning all the activities of the enemy. The espionage system must be very well studied, well worked out, and its agents chosen with maximum care. Enormous harm can be done by a counter spy. Even without referring to such an extreme example, great harm can result from incorrect information, regardless of whether it tends to exaggerate or underestimate dangers.

A most important characteristic of guerrilla war is the notable difference between the information the rebel force possesses and that known to the enemy. The enemy's agents must pass through zones that are totally hostile; they encounter the gloomy silence of the populace. In each case the defenders can count on a friend or a relative.

It is clear that preparation must be made to expel the enemy from the affected territory. Guerrillas must profoundly upset methods of supply and completely destroy lines of communication. The disruption of enemy efforts to supply himself forces him to invest large numbers of men in such attempts.

In all these combat situations, very important factors are reserves and, if at all possible, their proper utilization. The guerrilla army, by its very character, can count on reserves in only few instances. Therefore, when involved in an action, the efforts of even the last individual must be regulated and fully utilized. However, despite these characteristics a number of men must be kept ready to respond to an unforeseen situation, to contain a counter offensive, or to help decide a situation at a precise moment. Depending upon the organization of the guerrilla force and the situation at the time, a "general utility platoon" must be held ready for such necessities. Such a platoon must always reach those places in greatest danger. It might be called "the suicide platoon" or some other such name, but in reality it will have to accomplish the functions which the name indicates. This suicide platoon must get to all the places where the action will be decided: attacks designed to surprise the vanguard, defense of those sites that are most vulnerable and most dangerous, or any place from which the enemy may threaten to break the stability of the firing line. Such a platoon must be composed entirely of volunteers, and it should be considered almost a privilege for a guerrilla fighter to be admitted to membership. In time such a platoon will become the spoiled child of the guerrilla column, and any fighter in this unit can count on the respect and admiration of all his colleagues.

Concluded next month with

Organization of the Guerrilla Front

Supply
Civilian Organization
Role of Women
Health
Sabotage
War Industry
Information
Training and Indoctrination

NOWAR

NOWHEARTHIS: If the NOWEDS at NOWARMYMAG get many more like this one, there may be some EXEDS applying for return to active duty in the NOWAR

By NOWMAJ

TODAY the fashion is to speak knowingly and at great length about nonexistent organizations possessing catchy names which will supposedly operate in not-yet-too-well-defined environments. Although this freewheeling express(ion) of future doctrine is generally well constructed and is usually given the green light, some passengers believe the limited should not travel too fast.

This apprehension prevails because somewhere along the track from ROTAD, ROCID, and ROCAD, through MOMAR to MAXMAR, one station seems to have been by-passed. The sign at this neglected scheduled stop reads: NOWAR. (Rhymes with "how are.")

Before evaluating the usual considerations of inherent mobility, increased fire power, and wide-ranging communications, a word of explanation—NOWAR does not stand for "Novel Optimum Weapons Army" and it does not mean "no war." Just as FUTAR is the abbrevation for "future Army" and THENAR for "then Army," NOWAR is the short title for the "now Army." Now Army could have been shortened to NOAR, but to some this would connote "no Army."

All NOWAR components are prefixed by an adjectival now as in NOWMOB (now mobility), NOWWPNS (now weapons), NOWCOMM (now communications) and NOWSOLD (now soldier). One more important background note before further discussion; the time frame for NOWAR is *right now!*

On land, NOWAR's transportation is carried on mostly by means of a wheeled vehicle identified as a truck. Very little use is made of convertiplanes, ducted fans, and jet-propelled cargo vans. When available, steam, diesel or electric power is used to push or pull troops and supplies across terrain features in various-sized conveyances called trains. NOWAR's flexibility is illustrated by its ability to bring into play, at a moment's notice, another mode of dependable land transportation.

For air travel NOWAR is forced to depend on the NOWAF. The majority of NOWAF troop carriers are driven by NOWPROPS and require a pretty big landing field for comings and goings. Generally speaking, NOWAF aircraft are in the correct time frame, but there never seems to be enough of them to go around.

NOWAR coordinates with NOWNAV and NOWMSTS in matters of water transportation. NOWAR training programs do not yet include instruction in loading and unloading troop-carrying submarines.

The fire power of NOWAR is centered about a device which contains a highly potent form of gun cotton capped with a projectile fabricated from lead or metal alloy. In large and small actions, NOWAR relies on this contrivance, propelled from diverse metal tubes of sundry calibers, to form a base of fire from which to maneuver. NOWAR has access to guided missiles and free rockets with nuclear or non-nuclear warheads; however, death rays and disintegrating beams are not at present in the hands of troops.

To deliver NOWBULLS and NOWSHELLS to the enemy, NOWSOLDS have been issued faster firing and more dependable NOWRIFLES and NOWGUNS.

(Note: The NOWAR howitzer is a HOWNOW, not a NOWHOW.)

Tactically, the radio provides the foundation for communications. The THENPHONE, invented about 1876, has been improved and is employed for the majority of administrative traffic. Television has gained stature in NOWAR, but is installed mainly in day rooms and service clubs frequented by NOWSOLDS. The THENTELEGRAPH is placed in operation when needed, except that its modern relative—the NOWTELETYPEWRITER—receives and sends more messages. Automatic data processing is a phrase sometimes heard in the ranks of NOWAR, although many NOWSOLDS persist in alluding to it as "the electronic brain."

Not too many solar-powered helmet radios are found in the NOWINF. As a matter of fact, NOWINF officers often place emphasis on voice commands and even require that some training time be devoted to hand and arm signals. However, signal flags and lamps are definitely passé.

The NOWAR NOWSOLD

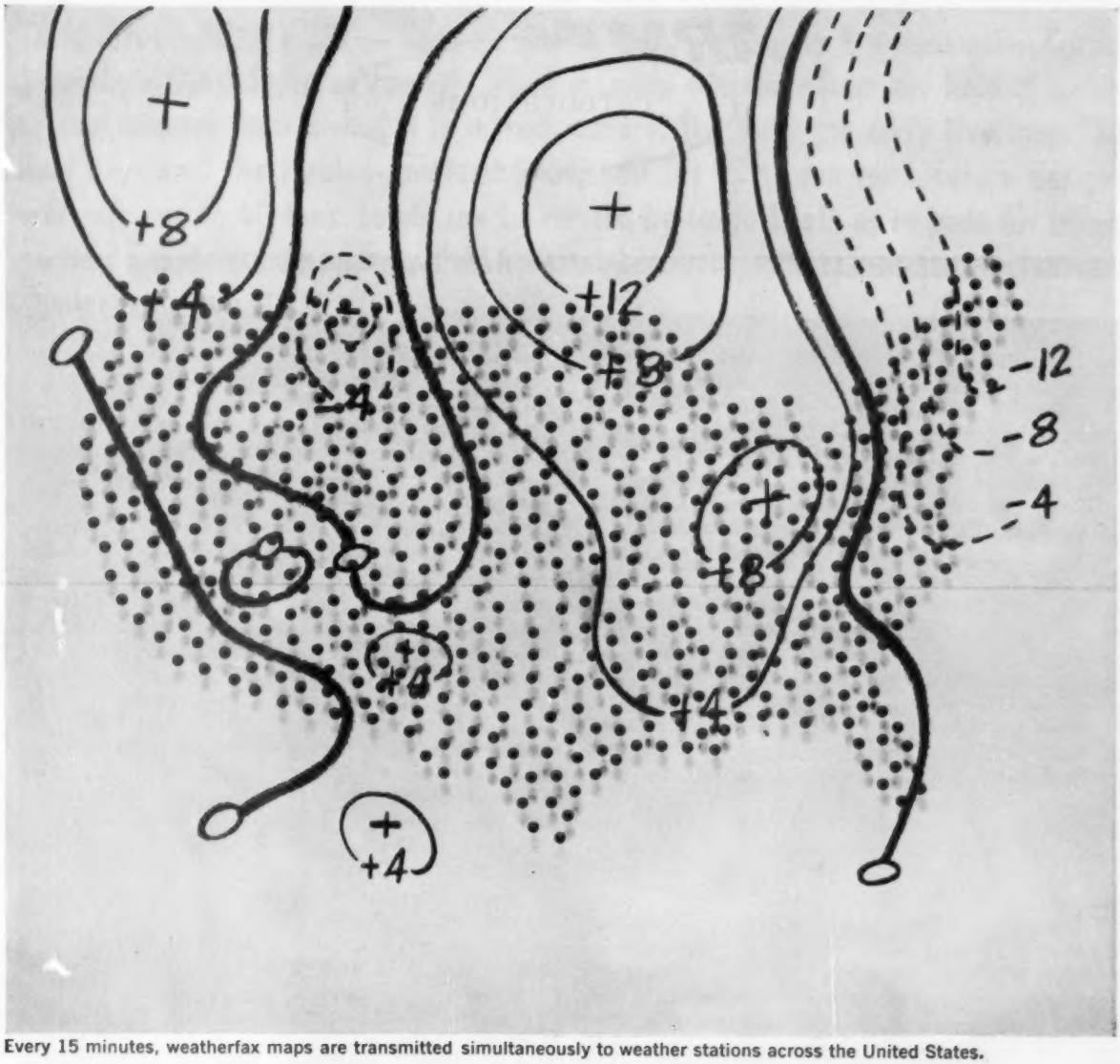
The NOWSOLD has not changed to any great degree from the THENSOLD, and indications point to the FUTSOLD adhering to original design.

The NOWAR NOWSOLD is interested in FUTAR, MAXMAR, and all the rest, but he is more concerned with his NOWMOB, NOWWPNS, and NOWCOMM. He realizes that NOWAR should stay abreast of late military developments, that "strategy must catch up with technology," and that new trends should be examined in field exercises. He does not believe, however, that too much stress should be placed on writings and concepts with futuristic backdrops at the expense of less concentration on NOWMETHODS and NOWEQUIPMENT. In this light, the NOWSOLD also thinks it proper to encourage, work on, and test novel ideas, if the workers and testers are discreet enough, for security reasons, to keep, until perfected, the results of the work and tests under their collective hat.

The NOWMAN of NOWAR would like to see neither an imbalance between nor an intermingling of future developments and current issues. He feels that immediate objectives become hazy when the direction of attack is obscured by simultaneous references to half-current and half-future doctrine.

When new apparel is available for issue, NOWPVT Jones will be ready to wear it. Until then, he needs to become proficient with what he has. Our NOWPVT may be conservative, but anyone who has been plucked from a THENREGT and dropped summarily into a NOWBATTLEGROUP has a right to be. Perhaps he's leery of ending up in a NOW&THENAR.

The NOWSOLD should be ready for NOWKOREAS as well as for a FUTALL-OUTCON. Flict, that is.



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ARMY cerebrations

IS THAT CHANGE NECESSARY? *Who says the new boss has to shake the status quo?*

CAPT. SHORT CHANGED

It is normal that the arrival of a new commander, from platoon leader up, immediately starts a round of conversation about what sort of changes he will initiate. Not all changes are bad, but change for change's sake can lead to disaster, especially in the morale of troops. During tactical training, we are constantly instructed to estimate the situation, to consider the advantages and disadvantages of various courses of action, then select the one that offers the best chances of success.

Why, then, don't some commanders hesitate before making major policy changes the second or third day after they have arrived? Evidently some believe they must give the status quo a vigorous shake just to let everyone know they are around. This is sure to produce an atmosphere of tense expectancy in the outfit. It has been known to effectively halt all initiative until the commander's ways become better known. Maybe it is partly because the immediate results of a bad change during peacetime are not too apparent and often can be covered up or corrected. In combat, results are tabulated in human lives, so decisions there usually are weighed more carefully.

A new commander should carefully analyze the immediate and long-range effects of any contemplated changes in policies that have proved very effective. He should carefully study the policies he inherited and the existing morale of the command, including how the officers and troops felt about his predecessor. It may be that the new CO's first change reverts to a condition his predecessor had worked on for a long time before correcting it. Regardless of who is right, when they see a policy installed, thrown out, and reinstated, subordinates become convinced that someone must be a bit off base. So why go into a sweat about *any* changes, good or bad?

I suggest that contemplated changes be placed in two major categories. The first includes those that affect the soldier personally, such as through his pocketbook, the effect on his family life, or the like. The second includes changes that affect him indirectly: a general buck-up in area police, a drive to paint everything that can't be moved, saluting a little more sharply, and so on.

The first category is loaded with traps for the unwary, while the second usually is harmless and evokes no more than a bit of old-fashioned griping. I believe that changes in the first category cause more officers and noncommissioned to begin looking for employment elsewhere than do many other things they accept as part of the job: waiting for housing, or being away from the family on maneuvers, or on hardship tours. It is more difficult to understand the reason behind a sudden order that requires all men in the battalion to stand reveille every morning at 0600 (because two men were late one day, even though many soldiers live 30 miles off post) than it is to understand why they must man an outpost line in Korea or on the DEW Line. Every change should have a sound reason behind it, and if it is explained to the troops they will accept it more readily. If you want them to paint all door handles green, tell them the reason is that you personally like green door handles.

When you see changes come down the chain of command, you look around frantically for a logical explanation. One point bothers me more than any other. During all my years with troops, the loudest gripes concerned orders of the let's-change-it-anyway type.

In taking over a new command, an officer should estimate the situation as carefully as if he were about to lead his unit in an attack. If everyone did that, the benefits to the Army, the troops, and to our country would be tremendous.

LIKE A LOVELY WOMAN. *To be wooed and won concurrent planning demands unceasing attention*

Col. TRACKBLOCK

We are at a corps headquarters in North Korea during late November 1950. The Chinese Communists have attacked Eighth Army. Outside it is 10 below zero, and a bleak Manchurian wind howls about the remnants of the badly bombed schoolhouse.

In a very small room two major generals, a colonel, and a lieutenant colonel are studying a map. General Able, the corps commander, explains to General Bravo his views on how Bravo's division should be employed to protect the flank of the corps as it moves south.

The division commander studies the map and nods in acknowledgment of the corps commander's comments. General Able turns to Colonel G3. "Bill, this is how I see it." (That's Command Guidance.)

G3 replies, "Yes, sir; and [pointing it out on the

***TRIPHIBIOUS SUPPLY LINE*—sea, air and land. For the Army Transportation Corps, Sikorsky's S-60 *Skycrane* recently lifted a Conex container from the hold of a ship at sea; minutes later placed it in a truck ashore. The S-60 can carry five tons. The next *Skycrane*, the turbine-powered S-64, will lift up to ten tons. Future designs will carry up to 40 tons. Loads can be carried by cargo hook, or in pods for transporting complete units such as field hospitals, communications centers or personnel.**

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map] this is how I propose the unit move to accomplish this." (That's Concept of Operations.) He turns to the lieutenant colonel and says, "Bob, write this up and give General Bravo a copy."

Since the command post is being readied for a move, there are no clerks, no typewriters. So the lieutenant colonel writes the plan on a piece of notebook paper and hands it to G3. Colonel G3 authenticates the paper and turns it over to General Bravo, who smiles and says to the lieutenant colonel, "Now take this back and make a copy for the record."

This little scene illustrates the logical development of a combat order: from the concept of the commander, through the concept of operations, to a plan, to an order, and the dissemination of that order to the commander who will execute it.

Unfortunately, not all our plans are so easily developed and disseminated. It seems that the more plush and comfortable the CP, the more formal the plan. Sometimes it takes six hours to have the overprinted map reproduced so that the finished plan can be a beautiful job befitting the starched olive greens of the staff. Too often, today, in our no-war-no-peace atmosphere we fail to realize that, so long as they enable the executing commander to prepare and conduct his action effectively and on time, a hand-drawn overlay and a few notes in the hands of a liaison officer are far more effective than beautifully printed plans that arrive too late to be studied properly; or that require a full-scale flap to produce another beautifully printed plan prepared by staff officers in starched OGs; and so on and on.

In brief, throughout all headquarters, we need to dust off and revitalize our concept and use of concurrent planning techniques. It's so very simple that the definition describes the solution.

Concurrent planning is the deliberate and thoughtful effort by planners at any headquarters to facilitate the operations of subordinate units by providing timely planning guidance and data to planners at the next lower headquarters. Concurrent planning has been effective when the chief planner at army group can call the chief planner at field army and say, "Pat, it's Course of Action A" (in some security code, of course). And if the field army planner can call the corps planner and say, "Joe, it's Course of Action A." If this simple message results in execution of the plan, with the formal written plan (or order) serving purely as confirmation, then concurrent planning has been effective. Otherwise, it has not.

Here are a few ways to insure adequate concurrent planning:

- Provide subordinate planners, through liaison officers or through electronic communications, with what they need to know of the planning guidance you receive from your commanding general.
- Inform them of the assumptions and contingencies you plan to use.
- Let them know the courses of action you will discuss with your chief of staff and which one you will recommend for adoption.
- Let them know the decision as soon as it is made, and add, "I'll get details to you as soon as I can." Then get the details *to* them.
- During command post exercises and field training exercises, have a daily planning conference (or briefing) for unit liaison officers. Use them as a means of transmitting to their units draft plans, hand-drawn (by them) overlays, and other papers.

Does all this sound simple? It *is*, which is probably why we don't do it. Concurrent planning is like a lovely woman and a beautiful flower: to derive any benefit from them, they must be cultivated with tender loving care.

IN DEFENSE OF THE DEGREE. *There may be evils, but a degree is a symbol of accomplishment*

COL. JAMES K. GAYNOR

It would be difficult to determine how the Army can benefit from an officer's college thesis on Child Health in the Classroom. Certainly this is an extreme example that Captain H. J. Meyer uses in "The Evils of Degree Hysteria" in the January issue. However, Captain Meyer offers suggestions which are worth serious consideration. Unquestionably the Army will derive little return from the financial assistance it provides an officer in the pursuit of his education, if the subjects in which he enrolls cannot in any way contribute to his efficiency as a soldier.

Perhaps there are abuses. Perhaps there are some who, entirely for personal reasons, take undue advantage of the regulations (necessarily broad in their provisions) which authorize assistance in the pursuit of higher education. Maybe some officers do neglect their military duties in the quest for college degrees.

I don't criticize Captain Meyer for pointing to possible abuses and suggesting corrections, but there is some question of whether he didn't overstate conditions. Doesn't he furnish a tailor-made excuse for the officer who is too lazy to study at night, on his own time, when his educational background definitely indicates that such a course would be beneficial?

Will some readers view his criticism in the same light that many well-meaning people viewed the courts-martial system after World War II? While there may have been instances of command influence on courts-martial findings during World War II, did that justify the charge by a well-known law professor in a national magazine that the Army's application of military justice is "drumhead justice?"

I do not condemn Captain Meyer or his suggestions. I wish only to place the matter in proper perspective. What I say is based on a master's degree and a doctorate earned during after-hours on my own time, with no assistance from the Army, in subjects that benefit the service. I have also taught several hundred servicemen in after-hours university classes.

There are assignments on which it is impossible to do after-hours study, but few officers are likely to receive such assignments consecutively.

No one should be relieved of military duties in order that he may pursue higher education, unless it is on a

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full-time basis and in courses which definitely will make him more valuable to the Army. Neither should one be made a "handcuffed volunteer" for enrollment in college courses. If a person lacks the initiative to arrange his own college work, he should not be subjected to pressure by his commander.

A soldier who is performing full military duty should be discouraged from enrolling in more courses at any one time than he reasonably can complete without interference with that duty. I suggest that two nights a week of classroom work is the maximum load any person can carry at any one time while doing full military duty. On many assignments even that many will be excessive.

I submit that the officer who broadens his education during off-duty hours may properly have the fact noted favorably on his efficiency report, and that his accomplishment should properly be considered with respect to promotions and future assignments.

I suggest too that, in some rare instances, it may be proper to note that an officer has failed to take advantage of educational opportunities. Say two officers of equal rank, both with only high-school backgrounds, are doing substantially the same work. One spends two nights a week at school while the other enjoys two or three at poker or insures that the local bar operates at a profit. Would it not be proper to note that the playboy failed to take advantage of his educational opportunities?

There may be evils in degree hysteria, but a college degree is a symbol of accomplishment. There may be other ways of rewarding educational achievement, but that is the one we accept in America, just as "officer and gentleman" dictates the standard of conduct of an officer.

After World War II many officers were integrated into the Regular Army who had proved themselves in combat but who perhaps did not meet a desirable standard of education. It is difficult to think that very many of these, during the intervening years, could not with a little effort have earned college degrees, granting of course that certainly there are exceptions.

While I must agree that courses in hotel operation, textile management, and greenhouse economics have very little relation to military skill, I repeat that Captain Meyer's article provides a ready-made excuse for the officer who is simply too lazy to gain a college education.

TREADMILL TO FRUSTRATION. *The clerk must never forget he works for the man below as well as the one above*

MSgt. GERALD L. CRUMLEY

Too many soldiers, carrying various papers typed by generally indifferent or uninformed clerks, make the Grand Shuffle from orderly room to battalion, to regimental personnel section, and to all the division and post staff sections or branches that have a technical interest. The trickle of administrative effort that flows down to assist these soldiers has too many back eddies—even dry spots. Too many of us are concentrating on the point of the pyramid and forgetting about what and who is down at the base.

It is only fitting that orderly room clerks meet the administrative demands of battalion; that those in battalion measure up and adhere to the paperwork needs of regiment; that regiment of course should contribute its drop of oil to the smooth-running machinery when its staff answers to ground rules set by division and post. Thus, the purely normal composite energies of subordinate administrators push upward through the chain of command, to support the final over-all mission. This is as it should be, a flood of effort that broadens and gains momentum as it climbs from one headquarters to the next.

What about the trickle that flows *down?*

A young soldier hikes more than a mile from his orderly room to the signal lab, in his hand a completed application for a new ID card. He stands in line for 40 minutes, finally to be told an additional entry relative to date of birth is required under "remarks," to be authenticated by his CO or personnel officer. What does this soldier say to himself and to his buddies, after finally getting his picture taken two days and six or eight miles later? The directive requiring this additional entry is published in the post daily bulletin *two months* after his long walk.

A senior noncommissioned officer applies for service schooling. Fourteen days later he is notified by the personnel section that he must concurrently submit a personal data sheet. The details are in his records, yet he must go to personnel, get his area aptitude scores, profile serial, total months of overseas service —all that sort of thing—then transfer them to the data sheets he has scrounged. He must resubmit the mess (I agree with the sergeant's term) back through channels to a section which in the first place could have taken care of it.

Whose fault? Academically, the first sergeant's and the battalion sergeant major's for not knowing in the first place about the requirement for the data sheet.

Who suffers? Perhaps the topkick and the sergeant by mild rebuff from regiment. But what about this earnest applicant, whose papers by now should have reached the Pentagon? After two weeks they are probably on the way back down the ladder because someone couldn't find the time or wouldn't buck policy to the extent of spending one minute on the phone for a conduct and efficiency rating, and perhaps four minutes in filling out the form. Two weeks, fast growing to three or four, might mean this sergeant misses his quota, flops a deadline.

Here you might mutter, "Just an exceptional case." Well, my little ditty bag is rather plump with observations of these exceptions. And what about this word "exception?" How many times does it become merely a three-syllable expression meaning the lame word *excuse?*

A senior sergeant applies for civilian components duty. After nearly two months of assurances from regimental personnel section that action is due any

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minute from Army, the original application is found buried in the applicant's 201 file with not even a draft of an indorsement by regiment.

How to do it? Change the indigent clerk to an indignant one by sitting on his shoulder to see that he never forgets he's working for the man below as well as the one above (all of us could remember this). Have the personnel officer and his sergeant root around those fat HOLD boxes in the main office when they're not riding the clerk's back. At the same time, they can make sure some of the in-between supervisors haven't set up some little policies of their own regarding the processing of applications.

How can the commander help? He must sign those applications, so we assume he wants them either approved or disapproved. He can follow their progress through a telephone call while lighting a cigarette, just to see if the papers are making reasonable progress toward their ultimate destination.

A small contribution to the downhill trickle, this kind, alert attention to the soldier's well-being. But look at the polish it puts on morale; add up the hours saved by getting the soldier off this treadmill and back on his job or off to his new one.

And didn't we wish for this attention once ourselves?

BLUEPRINT FOR CONQUEST. *Dispersion all the way back*

MAJ. ROBERT DE MARCELLUS

The annihilation of the Army of the United States took place at 0300 on 3 January 1962. The plan for this most remarkable strategic victory in the annals of military history actually germinated, however, a year earlier at a meeting of the general staff of the Soviet armed forces.

During early 1961, Soviet planners repeatedly toyed with the idea of a surprise nuclear attack upon the United States. Tempting as such a knockout blow appeared, many members of the general staff cautioned against it. General Ivan Karansky, who had carefully studied United States military actions during World War II, and had established a brilliant record as a tactical commander, repeatedly warned that the resiliency of the American armed forces, particularly the army, made most doubtful the outcome of any war not won by the USSR during the opening hours. Karansky insisted that ballistic missiles merely fulfilled the role of heavy artillery, and that no attack be launched unless it could be successfully followed by airborne invasion. He argued that the presence of reserve combat units, principally those of the 27 National Guard divisions dispersed throughout 2,500 communities, could render very doubtful the success of such a venture.

While presenting a staff paper on the availability of airlift for the Soviet Army, General Karansky had again expressed this view. While a dozen divisions minus heavy equipment could be airlifted by 500 TU-114 transports in one operation, and vast quantities of supplies could be confiscated from the populace, the presence of enemy army units could mean drawn-out operations ending in defeat.

During the presentation of the report, Marshal Zubobin quietly toyed with a chess pawn; the light shone on his bald head, while his husky shoulders slumped in his chair. At the conclusion of the discussion, he finally shifted his weight and placed the pawn on the table. "Gentlemen, I disagree. We will attack, and we shall win within 60 minutes."

The Marshal scrutinized the pawn while all officers waited in suspense. "First, comrades, we shall initiate a limited war that will directly involve United States forces, perhaps an attack by volunteers on NATO and SEATO members. We shall force the United States to mobilize. The Army of the United States will then no

SIDELIGHT — CHARLES S. STEVENSON

Leavenworth grads who rise fast and (sometimes) plummet likewise

Colorful graduates of the U. S. Command and General Staff College aren't confined to the Pattons, Walkers, Ridgways and Gavins. You doubtless can remember picking up your morning paper and reading that a former Fort Leavenworth student has become an ambassador, a secretary of defense, is leading a revolutionary movement—or, perhaps, has ceased to be a president through lead poisoning.

These are not U. S. citizens but men from one of the 64 nations that send officers to the Command and General Staff College at Fort Leavenworth. While attendance at the College usually is a sign that the foreign student is destined for high responsibilities back home, there's considerable evidence that it doesn't always mean security or permanency.

Take the example of former Major Carlos Castillo Armas, Leavenworth Class of 1945, from Guatemala. The major made it big in 1954, assuming control of the Army and later being elected President. The opposition ended his career—permanently—in the Latin manner.

A major from El Salvador in 1946, José Maria Lemus returned for a visit to Leavenworth 13 years later—this time as president of his country. Lately, however, Lemus isn't working at that job either—but he did escape with his skin. Classmates might be able to make contact with him in San José, Costa Rica.

Airborne Lt. Col. Vuong Dong of South Vietnam, who attended the College in 1958 when the commandant was Major General Lionel C. McGarr, had a fast rise to fame and drop to oblivion in three short years. Vuong had a more dramatic meeting with General McGarr again during the recent uprisings when McGarr, Chief of the Military Assistance Advisory Group, South Vietnam, was chosen as an intermediary between the rebel representative and President Diem.

No alumni notes are currently being sent to 62 officers who at-

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longer be dispersed in thousands of communities, but will be concentrated at a couple of dozen mobilization stations—*targets* to us, comrades! We shall destroy their army, its reserves, and cadre personnel with as many weapons. Our troops will encounter no resistance. They will land within minutes of our nuclear attack while air-defense units are still in shock. Their cities will be our hostages before morning."

There was a minute of silence as the Marshal rolled the ivory chess man between his experienced fingers, and the generals' minds flashed over the possibilities the cagey old Marshal had presented them.

The silence was broken by General Karansky. "Marshal, there is no reason for assuming that the United States would mobilize in that fashion. All their tactical doctrine teaches dispersion, and there are vast areas in which their units could mobilize while completely dispersed in units no larger than battalions. Hundreds of small ports on their coastline could be used as preplanned storage, marshalling and shipping points."

"True," the Marshal replied, "they could, but they will not. All their mobilization plans and mobilization assignments of administrative units are predicated upon a mobilization patterned after the one that worked so efficiently in three wars. It is not in human nature to change. They teach dispersion on the battlefield because the lesson was learned through heavy combat losses. Dispersion during mobilization is a new dimension and the lesson has yet to be learned. Besides there is all the weight of economics, and ease of logistics and administration. Because Americans worship organization, it would be impossible for them to conceive of a different form of mobilization. In their camps, they must have conveniences such a plumbing. No, comrades, they will play into our hands as surely as bees are attracted to honey. Then we will crush them!"

The Marshal brought his hand down upon the table with a heavy blow. No doubt remained as to the decision.

As the officers filed from the room, gripped with suppressed excitement, they felt that victory was certain. Now it was only a matter of staff work and a little patience.

FALSE STRENGTH IN NUMBERS. *Let's get back to the original meaning of special duty: a short, temporary absence*

Maj. THOMAS W. BOWEN

The increasing practice of showing a unit strength report reflecting that "my headquarters" is working only on table of organization allotment has generated new personnel problems. A cursory examination of the status reports of the headquarters of two divisions, two battle groups, a combat command, and two battalions, showed that each was within an average of 5-plus per cent of its TOE strength. These figures were based on "assigned strength." However, a check of lower headquarters and units revealed that each of these had "special duty" men working at the next higher headquarters.

The numbers on special duty ranged from a low of six enlisted men from one battle group to 23 officers and enlisted men from another unit. Of course, in the lower headquarters the process was repeated until the loss finally settled among companies. Here these soldiers are shown as being not present for training, but on special duty. Perhaps secret duty would be more descriptive.

I don't say that all officers and men on SD are being improperly utilized. Many are in jobs that are essential to the proper functioning of the Army. But it is wrong to report as members of combat outfits those men who are on duty at places other than the units to which they are assigned. To do so leads to a false impression when assessing a unit's combat power according to its assigned strength. The company's morning report showing of 100 per cent of authorized strength turns out to be only 85 per cent when you subtract gate guards detailed on special duty to the post, the clerk on special duty at the

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tended the College in 1944. These were "free" Czechs and Poles who returned to their countries after World War II. Now they are behind the Iron Curtain.

You shouldn't jump to the conclusion that a CGSC diploma is a prerequisite for a violent end. Former students now in top military assignments at home are Lt. Gen. Tsong-Kan Pee, Republic of China; Lt. Gen. Ham Byung Sun, Korea; and Brig. Gen. Abid Ali Bilgrami, Pakistan.

It took only four years after attendance at the College in 1955-56 for Lt. Gen. Kim Chong Oh to become chairman of the Joint Chiefs of Staff of Korea. Similar posts in the Chilean and Guatemalan armies, with ranks of general, are held by ex-Leavenworth majors Rodolfo Otto Muller and Augustín Donis.

In school as a brigadier general, Gabre Salassie Issays of Ethiopia became Chief of Staff of the Emperor's Military Cabinet.

A 1935 major at the College, General Ho Sheh-Li, of the Republic of China, is head of his country's military mission to the United Nations. Retired Lt. Gen. Lee Chong Chan became Korean Minister of National Defense only a few years after attending Leavenworth.

The Secretary of the Peruvian Army is former student Lt. Col. Alejandro Cuadra. The Commanding General of Thailand's Border Police is Chan Ansuchote, who came to the College as a lieutenant colonel.

Then there's CGSC's most famous non-graduate, the unforgettable (though the College might like to forget the whole affair) Lt. Gen. Rafael Trujillo, Jr. This scion of the dictator of the Dominican Republic led school authorities, reporters, socialites and diplomats through a madcap tour that presented problems ranging from high living to logistics. The final Leavenworth report on why Trujillo didn't graduate may well be a masterpiece of understatement: he cut too many classes.

Some 2,100 other foreign officers have, however, worked hard and earned diplomas from this famed U. S. Army college.

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No organization has had more experience in drone control than Sperry. Beginning with the first aerial torpedo in 1915, this experience covers a wide spectrum, including QB-17, QF-80, SD-2, QB-47 and QF-104. Sperry Phoenix now is delivering to USAF a revolutionary Microwave Command Guidance System permitting precision remote control of many types of pilotless craft over hundreds of miles.

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battalion's mail room, the men on special duty with the division's pistol team, and the clerks on special duty at the personnel office.

That 85 per cent actual strength is a great deal different from the 100 per cent reported. The division AG, looking at the 100 per cent figure, thinks you're in top shape, and perhaps everything is fine until your outfit moves into the field. Then comes the reckoning. Even though some of those SD men return to you before you take the field, often they add little except numbers to your unit's strength. Through no fault of their own these men lack training which they need if your outfit is to pull its weight in combat.

There are two aspects of this special duty status. One gives a false impression of the strength available in companies; the other robs the missing men of their rightful training. Even when they return, if their training must include the minimum required, it must begin far back in the cycle.

What can we do? To assign soldiers to the positions or in the units where their work is performed will alleviate most of the difficulty. If a division is charged with post security, assign the guards to the post unit or headquarters, and show they are needed. If headquarters needs additional clerks, let their assignments be reflected on the morning report of the headquarters. If every headquarters robs its subordinate units and seems to be functioning with currently assigned strengths, how can designers of organizational tables determine if personnel spaces are adequate?

One side benefit in assigning SD men to the units where they work is the positive effect on company commanders. They will be *his* people, and not merely for rations and billets. The adjutant won't phone to say that Private Joe Blow (on SD with the personnel section) has been granted a three-day pass by his supervisor at battalion. Would Captain Bravo please issue it to him, since he is Blow's commander? This procedure sits very poorly with Captain Bravo, who for months hasn't been able to issue any three-day passes to his other people.

More important, under my proposal the assigned strength of the company would reflect its trained combat power—not strength at division headquarters or at the post guardhouse, or untrained, part-time strength. Without referring to status reports, we could get a realistic picture of the company from its morning report.

The increased strength among headquarters may also cause higher commanders to see their staffs in a different light. A staff that can work within authorized limits certainly must be an effective one; the staff that needs a strength of 150 per cent must be something else.

Let's get back to the original meaning of special duty: a short, temporary absence. Let's not use it to account for a soldier on permanent duty at other than his assigned unit. Lower units are never happy about supplying higher ones with personnel, but the pain is relieved somewhat if, when a soldier's services are lost, his name can be removed from his unit's morning report.

If a job needs doing, let's assign to it a soldier on the basis of an honest need. Perhaps then the next revision of the TOE will include a space for the job. But concealing a real requirement benefits no one, and creates only false impressions up and down the chain of command.

PLAN NOW TO ATTEND THE

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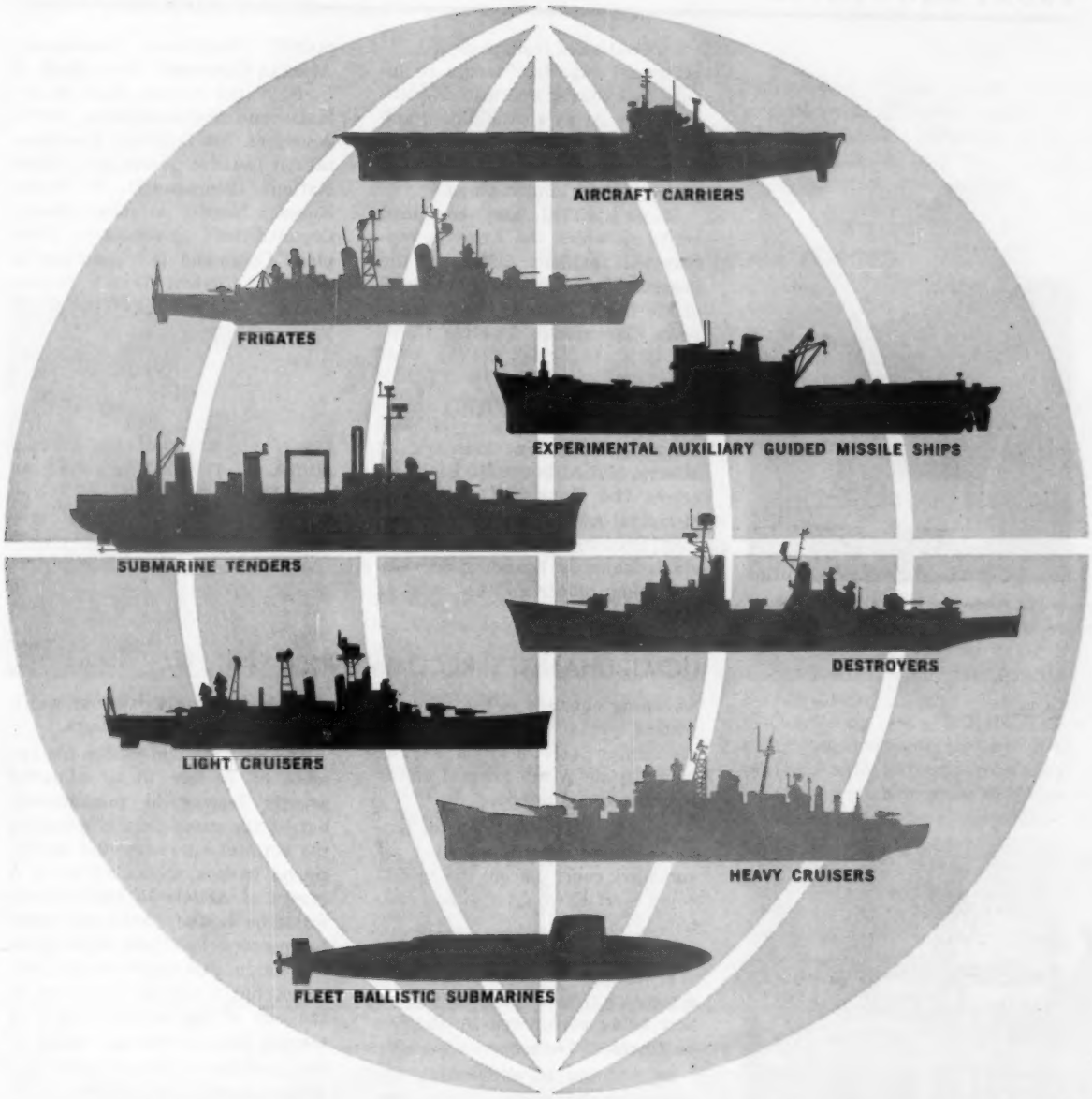

assignment: make a complex missile system work

That was, and is, Vitro's key role in our nation's surface and undersea missile fleet. For Vitro has had the job of combining the many talents involved in converting and outfitting each missile ship shown above. With that experience and with special techniques it developed for those jobs, Vitro has the ability to fit the many parts together into an effective system. Working with DOD personnel, other contractors and shipyards, Vitro's experienced technical men solve perennial interface problems and handle complex modern weapon systems from concept through checkout.

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SCIENTISTS AND ENGINEERS: JOIN THIS TEAM

(Continued from page 16)

personnel experts, "serves to insure that during operational planning, the Army's capabilities and its requirements for an adequate force structure are integrated properly into unified plans."

Major unified and combined staffs on which the Army is represented include: Office of the Secretary of Defense; Joint Staff of the Joint Chiefs of Staff; European Command; Pacific Command; Caribbean Command; Alaskan Command; Joint Staff of U. S. Naval Forces, Eastern Atlantic and Mediterranean; North American Air Defense; Continental Air Defense Command; United Nations Command/U. S. Forces Korea; North Atlantic Treaty Organization; Subordinate Combined Command Headquarters of SHAPE; Central Treaty Organization; and Southeast Asia Treaty Organization.

Patterson Award Winner

PATTERSON AWARD

Second Lieutenant Howard R. Mosley, 82d Airborne Division, receives the Robert P. Patterson Memorial Award in a ceremony at Fort Benning from Secretary Elvis J. Stahr, Jr. Standing between the young officer and his chief is Mrs. Patterson, widow of the late Secretary of War. The award, an inscribed service pistol, $250 and a certificate, was for the outstanding infantry officer candidate to graduate from the school in FY 1960.

UCMJ CHANGES RECOMMENDED

Sweeping changes in the military justice system may be in store if recommendations of a recent study by an Army general officer committee are adopted.

Gone would be that bane of junior officers: additional duty of summary court officer; the special court martial would also be eliminated.

The committee, headed by General Herbert B. Powell, CONARC commander, made the study. It is now being considered by the Department of Defense.

In addition to eliminating the summary and special courts, pretrial and trial procedures of general courts would be simplified and an indeterminate system of sentences similar to those of many civilian jurisdictions would be authorized.

The committee concluded that the present code would not work well in wartime and at the same time cited general courts-martial proceedings as too slow and cumbersome. Its findings showed that commanders do not have enough authority to take action without resort to summary and special courts. A number of recommendations provided for streamlining the general court without sacrificing the rights of soldiers.

The new system would file the teeth of Article 15 by allowing greater leeway in punishments but at the same time eliminating the stain of summary and special courts from a soldier's record. A record of Article 15 punishments would be kept on file as references for personnel actions, subsequent correction, and court-martial purposes, but would be destroyed at the end of the soldier's term of service. New provisions would allow a soldier to demand trial by a general court if he refused to accept Article 15.

To assure stability in military law, the committee would increase membership in the Court of Military Appeals from three to five, with two of these limited to four years service, one to be appointed every two years.

Sources of information used by the committee included comments and recommendations of all officers with general court jurisdiction in the Army. Comments of Army agencies were studied as were those of more than 150

(Continued on page 85)

Engineers work on scissors bridge during Wintershield maneuvers in Germany

judge advocates and 50 military defense counsels.

In addition, attitudes and opinions of almost 2000 enlisted men and 100 company, battalion and battle group commanders were considered. Military codes of other countries including Italy, France, Canada and the United Kingdom were also studied.

NEW CHIEF OF WEST GERMAN FORCES

Gen. FRIEDRICH FOERTSCH

Lt. Gen. Friedrich Foertsch of the West German Army, who had been Deputy Chief of Staff at NATO headquarters in Paris, became Inspector General of the West German armed forces (its highest post) on 1 April, succeeding Gen. Adolf Heusinger who will be the Chairman of NATO's permanent Military Committee in Washington. Gen. Foertsch fought on the French front in 1940 and later against the Russians. Captured by the Russians he spent ten years as a prisoner in the Soviet Union.

MOBIDIC AT ZWEIBRUCKEN

MOBIDIC, the Army's first operational mobile digital computer, is now installed and controlling thousands of Seventh Army supply requisitions for items of equipment such as replacement parts for rockets, guided missiles, electronic warfare, air defense, combat surveillance and atomic artillery. The computer is set up at the Army Stock Control Center at Zweibrucken, Germany.

Developed by Sylvania and the Signal Corps R&D labs at Fort Monmouth, MOBIDIC occupies three 30-foot trailers. It made the move in a four-stage trip from Needham, Mass., to Brooklyn Army Terminal, and to St. Nazaire, France, and overland to Zweibrucken.

The Army says MOBIDIC is completely transistorized and will perform with extreme reliability in combat, withstanding extremes of shock, vibration, humidity, dust and temperature to provide high speed information processing on fire support, intelligence, logistics, and administration to help commanders in conventional or nuclear warfare.

STRAC paratroopers—always ready—prepare for a simulated combat mission

ARMY authors

ARTHUR T. HADLEY (page 23), a World War II armor officer, was for several years *Newsweek's* correspondent at the Pentagon. This, his fourth article in ARMY and its predecessor, is based on a summer study of arms control sponsored by the American Academy of Arts and Sciences.

COL. WILLIAM E. DEPUY, *Infantry* (page 30), was a battalion commander during World War II, has held several assignments on the Army General Staff, and recently completed the course at the British Imperial Defence College. He now commands a battle group in Germany.

MAJ. GEN. EARLE F. COOK (page 39), is Deputy Chief Signal Officer. During a previous tour as CO, Signal Research and Development Agency, the first solar conversion for satellites, used with Vanguard I, was developed. He also directed Signal Corps efforts in Project Score, the "talking satellite" developed by the Army.

LT. COL. ROY E. APPLEMAN, *Staff Specialist, USAR* (page 44), was a combat historian with Tenth Army in the Okinawa campaign and helped write the official history of that campaign. In Korea he spent several months with different elements of Eighth Army and X Corps and in Tokyo with the Far East Command. In civilian life he is historian of the National Parks Service.

LT. HAROLD C. LYON, JR., *Infantry* (page 50), USMA 1958, is a graduate of the Airborne and Ranger Schools at Fort Benning, and now commands a rifle company of the 101st Airborne Division. He wrote "Man Against Tank" in the August 1960 issue.

ALAN JENSEN (page 53), served in the Quartermaster Corps in Europe until 1955, when he joined the staff of a Moroccan newspaper. Since 1957, he has been in France reporting on NATO and U. S. military activities for various American newspapers. His research on the NATO Supply Agency began at the request of Brig. Gen. Charles A. Heim, its general manager, who wanted a historical report covering the Agency's first phases.

COL. JAMES K. GAYNOR, *JAGC* (page 74), was assistant G2 of V Corps during World War II, and earned degrees of LL.M. and S.J.D. at The George Washington University after attending night classes while on active duty. After a tour in Army Legislative Liaison he is in the Office of The Judge Advocate General.

MASTER SGT. GERALD L. CRUMLEY (page 76), is an MOI instructor with the 4th Training Regiment at Fort Leonard Wood, Mo. This is his third article in ARMY.

MAJOR ROBERT DE MARCELLUS, *Transportation Corps,* Florida Army National Guard (page 78), who was an infantry platoon leader in Korea, is a public relations consultant in Palm Beach, Fla. This is his seventh article in ARMY.

MAJOR THOMAS W. BOWEN, *Armor* (page 80), is on duty at the Military Academy after completing graduate work at Vanderbilt University. This is his fourth article, the latest being "What Good is the RBI?" in the February issue.

CHARLES S. STEVENSON (page 78), an occasional contributor, is Trustee-designate of the Association of the U. S. Army.

If the Deterrent Fails

(Continued from Page 29) tactical weapons. From roughly 1950 to 1958 the United States had the capacity to wage tactical nuclear war decisively without having it waged right back at itself. During this period America could determine the limit that was to be placed on the use of atomic weapons in limited war.

Today America cannot set that limit. The Soviet Union too has the capability to wage tactical nuclear war. At any moment the United States or Russia can unlimit a limited nuclear war to any degree it wants. It is important for the United States to make sure that it is not the country that has to increase the likelihood of general war by breaking limits in order to gain the necessary advantage, unless the necessity is vital.

Wars are limited by the accidents of history, but history is gross. She needs clearly defined lines on which to base her boundaries: lines like the Yalu River in Korea or the Austro-Hungarian border during the Hungarian uprising. These lines may not make much military sense. Why fight Chinese Communist aircraft in the sky on one side of a river but not on the other? But they make sense in the historical context.

The line between nuclear and non-nuclear weapons is such a line: illogical perhaps to the soldier, airman, scientist, or academician, but completely understandable to every citizen of the world. On the other hand, in the gradual increase of nuclear explosive power from a 100-ton weapon to a 500-ton weapon, to a kiloton weapon, to 10 kilotons, to 20 (the size of the Nagasaki bomb), to 50 kilotons, to 100 kilotons, to a megaton, how does the line get drawn? And remember, the line will be drawn in the heat of battle. The division between nuclear and non-nuclear is great. The division between tactical and strategic nuclear weapons is not.

Western ability to meet local threats with a mobile force able to fight successfully with high explosive will offer another alternative to general nuclear war. And the presence of this alternative will reduce the likelihood of general nuclear war. Threats will still arise. And meeting them will still be full of anguish and cost. The possibility that general nuclear war will be the ultimate result of a peripheral challenge will still hold. But the constant fear and preoccupation that every little challenge may signal the beginning of a major nuclear exchange will have greatly lessened. The development of a non-nuclear answer to aggressions short of all-out attack provides the second vital prerequisite for controlled limitations of arms.

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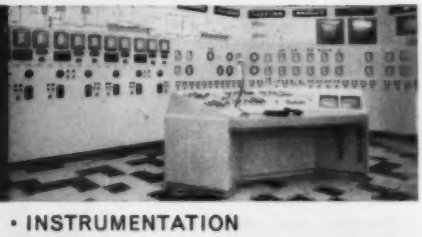

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ARMY irons in the fire

MEETING THE COST CHALLENGE

In fielding the Army's weapons systems, cost must be considered in relation to battlefield yield

Lt. Gen. J. H. HINRICHS

In the national effort to cope with the Communist challenge, we have come face to face with another challenge: the rising costs inherent in the modernization of the defense establishment. That is the challenge to which I will address myself.

The Ordnance mission is to field the Army's weapons systems. We likewise provide some of those systems to our sister services and other customers including the Military Assistance Program. Of every dollar provided to the Army, Ordnance invests approximately 40 cents in design, development, procurement and maintenance of its weapons. Currently, we spend about 55 per cent of the available money for conventional weapons—tanks, combat vehicles, artillery, and small arms—and about 45 per cent for rockets and guided missiles. That split must provide the Army with balanced firepower, balance in the kind of weapons, balance in the types of warheads as between nuclear and conventional high explosives.

The higher costs we are experiencing, and the size of our budget, force us to rule out some probably desirable weapons systems and restrict the quantities of proved systems we can procure. We don't have enough money for everything. We have on the shelf engineered packages that represent modern useful weapons, but we can't procure those arms for lack of funds. Unless over-all defense spending increases, the only way open for us to buy more of the new weapons is to reduce the cost of development and production.

Now I am a realist and I have learned to face the facts of life. We must live with them. We must organize and conduct our affairs so that we don't spin our wheels in useless attempts to escape them. Let me make a few observations, therefore, to set the stage for what follows.

Investment related to performance

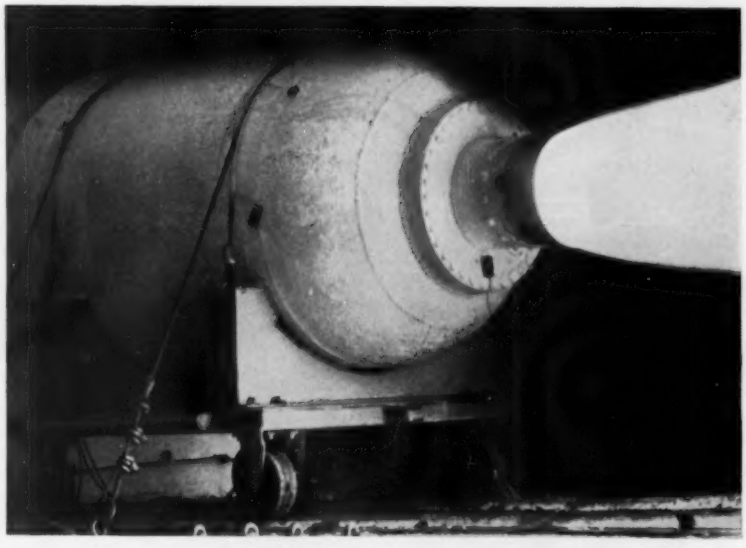
First, the investment we make in any weapons system must be related to the performance the Army expects from that weapon. There is an economic factor inherent in the capabilities of any given system. A rifle may be a good buy at $100. Likewise, a long-range nuclear ballistic missile may be a solid investment at $1 million a copy, because of what that weapon can do in terms of destructive potential—under a given set of circumstances.

Secondly, weapons systems must satisfy military characteristics and requirements. These parameters are stated by the combat arms. One major mission—if not the major mission—of Ordnance is to translate these military characteristics into sound engineering and production terms that industry can understand and use.

Next, the user must have the weapon at the time and in the quantities he considers essential.

Now there are various hazards on our course. Here are a couple: Resources available to the system manager are not always adequate to insure his freedom of action in controlling costs and time. Also, there are abundant statutory and regulatory sand-traps that further restrict the manager's freedom of action and his decisions.

Weapons—not pieces of paper—



White-hot flame from "Flexadine," solid-propellant developed by Rocketdyne, bursts from motor in temperature of minus 75 degrees F. Successful test at McGregor, Texas, promises significant operational advantages for tactical battlefield missiles, enabling them to operate under severe temperature conditions without need of special heating blankets or handling equipment.

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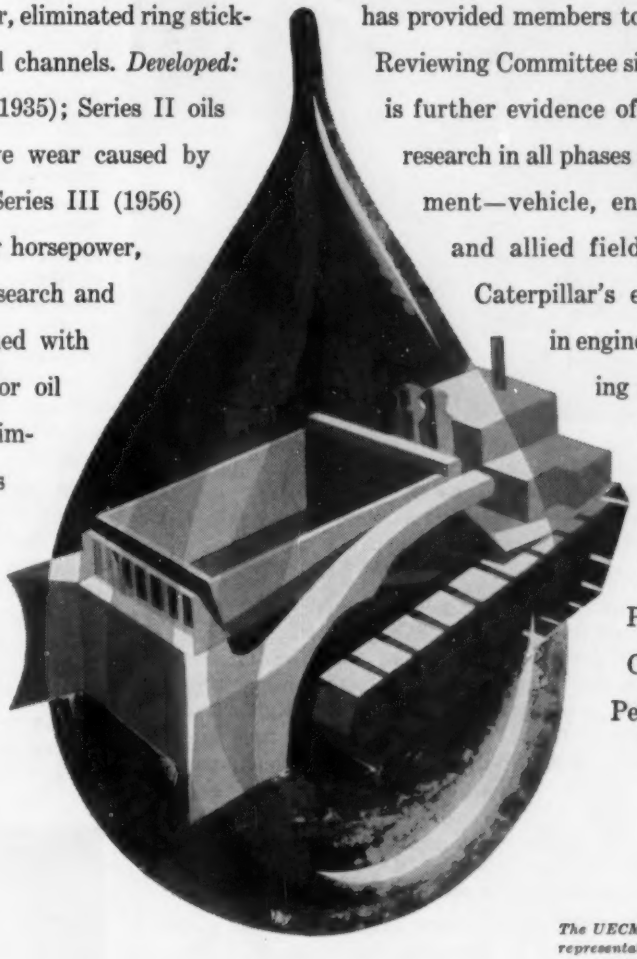

The UECM, currently under development, is representative of the ability of Caterpillar research in all phases of vehicle development.

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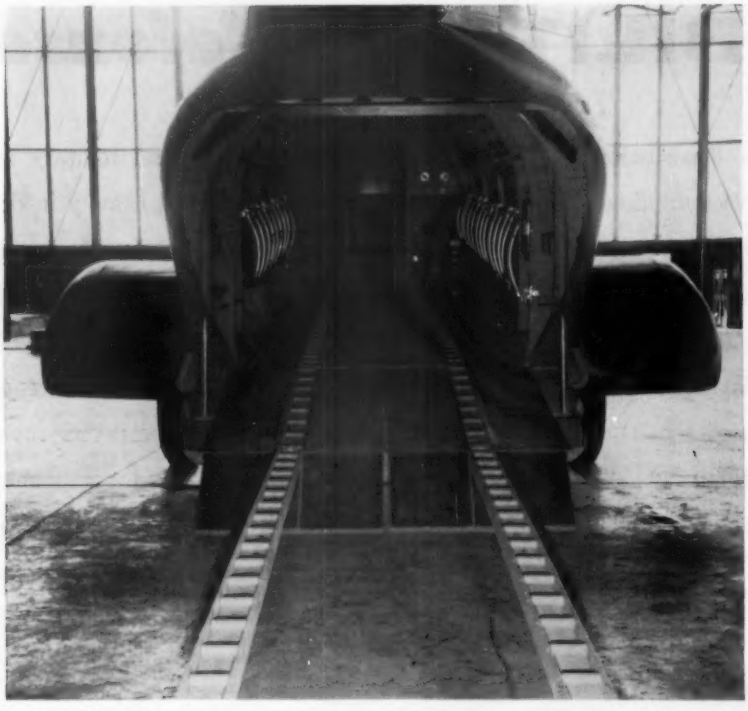


Mockup of the Boeing Vertol 107 helicopter shows the fuselage sloped from front to rear while on the ground, an innovation which allows cargo to be rapidly unloaded in rugged terrain. To load cargo under the same conditions, the 107 is equipped with a winch which hauls the cargo up the extensions to the rear ramp. Vertol says that one man can load or unload cargo in three minutes.

in the hands of trained and determined soldiers are what are needed to win wars. When trouble develops and the chips are down, we must fight with the weapons systems then available in quantity or which can be produced in volume quickly.

The problem of lead time

So much has been said about the problem of lead time that I won't muddy the waters any more. Let me say simply that the speed of technological advance (and we have no monopoly in this area) makes it imperative that we have no "dead time" in weapons development and production. We must insure a reasonably useful lifetime. We must also insure that new weapons will not have been overrun by a rival technology during the time it takes to get them to the troops.

The reduction of dead time is very complex because of the kind of weapons required today. To illustrate, consider Nike Zeus. This antimissile missile must intercept an incoming warhead traveling at a velocity of 15,000 miles per hour and complete the entire process of detection, identification, tracking, and interception in time intervals so short as to rule out human intelligence. Sometimes the dead time is the result of—shall I say "nontechnical"?—causes.

A sound development program

More than a hundred years of Ordnance experience has taught us that the answer to the first problem is a sound and continuing components development program. Only if you have done the necessary homework anticipating the need, are you in a position to meet it when the time arrives. It was just that kind of homework which enabled the Army to orbit an earth satellite 84 days after we received the go-ahead. It is that kind of homework we have done and continue to do on the Zeus system.

While modern weapons programs are complex indeed, they do not pose an impossible conflict between cost control and successful development. I have talked this out with many contractors many times, and we are in general agreement. Sometimes, of course, it takes persuasion or finger-pointing to tell them where and how they can cut costs.

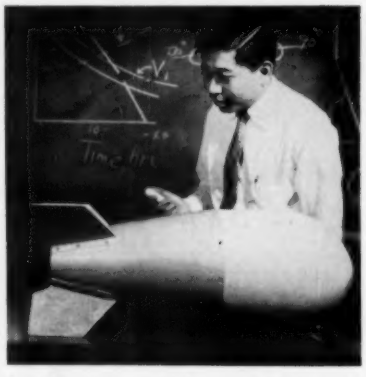
Let me tell you some of the ways in which we are exercising cost control in our development and production programs.

In April 1956 we acted to put teeth into the review of qualitative requirements. There are two objectives in this procedure: to assure the maximum use of standard components, and to make sure that our ability to maintain them was fully considered. These reviews are conducted six times during the course of every program. They begin before design is initiated and they continue through the service testing. I believe we can improve even more.

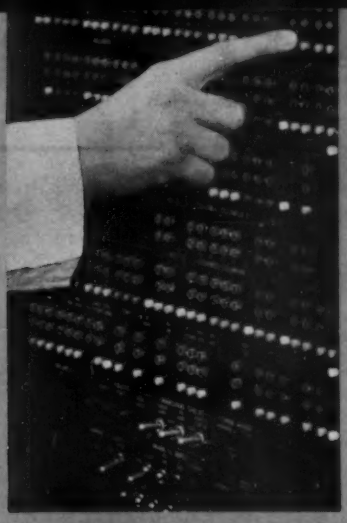
As early as practicable in the design stage we introduce industrial production engineering in anticipation of procurement. Without that essential step early in the game, we induce high costs or dead time, or both.

Ordnance monitors industry

Then we must determine where we can break out components or sub-systems for direct procurement



Davy Crockett warhead gets close-up study by Raytheon engineer Gim Fong at the firm's plastics plant. Raytheon is producing tail fins, tactical and practice nose cones under an Army contract.



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in order to obtain competitive bidding. During the research and development phase and while the weapons are in production, the contractor performance is monitored by competent Ordnance personnel so that we can be sure the end product will meet specifications, and also that costs are kept to a minimum.

Ordnance development agencies scrutinize the *user's* stated military characteristics to ferret out any area wherein modifications would reduce the complexity of the weapon or reduce costs. If we find such instances, we try to convince the user of the soundness of our judgment.

Procurement planning for volume production bears directly upon cost. Initial planning pre-dates by several years—we hope—the signing of the production contract. It must deal, sometime in crystal-ball fashion, with such factors as labor costs, facility costs, competitive possibilities and the availability and cost of materials. When the program comes up to the point of execution, necessary decisions reflect the price realities at that time, the user's demands, and the available assets. We cannot buy with optimum economy when the assets are inadequate to the complete task.

The Ordnance experts who are charged with procurement have a unique set of instructions. They list 16 means of developing and maintaining conditions that promote competition among potential sources of research, development and production effort. Among other things, these instructions require that opportunity for competition be provided small businesses and labor surplus area industries.

We are constantly trying to improve the quality of the technical data or engineering package which the Ordnance commands and arsenals prepare and which translate military characteristics into terms that industry can understand and can produce.

Recent accomplishments

As examples of what Ordnance has accomplished in recent months, I will cite instances that testify to the importance of sound engineering—or creative engineering, if you will—to the defense requirement.

Some weeks ago the Army announced the development of a new manufacturing process that can be applied to the production of eight-inch steel artillery shell. By using unfinished commercial grade forging steel, a saving in material cost of $19 per ton was realized. That would approach a total saving of $1 million annually based on peacetime requirements. During wartime it could run into many millions of dollars. Now we are moving to exploit the same process in producing smaller-caliber steel shells, with proportionate savings. In this case, we found an able and willing contractor who—along with Ordnance—stuck out his neck. We proved that a good shell could be fabricated out of less expensive metal—something we had been convinced of for many years. He also improved the manufacturing process to cut costs further: $1.90 for steel and $2.10 for processing per shell.

A close look results in savings

Also, one of our missile contractors made a proposal on ground handling equipment that seemed to warrant a closer look. He was directed to obtain proposals from five other sources. This led to a firm, fixed-price contract at a saving of 40 per cent from the prime's bid.

Called a "Cargo Swing" by Vertol, new external cargo sling, being demonstrated on a Vertol H-21 Shawnee, virtually eliminates control problems.

By breaking out metal parts in another missile program and obtaining proposals from 29 sources, a saving was realized of 23 per cent per unit. A low-bed trailer broken out of a third missile program achieved a 15 per cent saving. In other cases, savings were realized of 11 per cent on a missile loader and 16 per cent on a warhead.

The kind of review I mentioned earlier, during the development stage of a new missile system, eliminated 384 peculiar parts in favor of standard ones.

The cost of ball-type powder for the standard NATO 7.62mm cartridge was reduced 24 per cent in 1960. This resulted from intensive negotiations with the sole source. That company is not going broke on the deal, either. In one of our procurements for the Air Force, a saving of more than $1 million was achieved by going out on competitive solicitations.

I could cite many other instances of comparable savings made possible by sound production engineering. This is a routine effort, in point of daily practice, but it requires much more than routine thinking.

We are now going deeper into the contract structure, checking proposed awards by primes to second-tier subs, evaluating the adequacy of competition, of cost breakdowns, of pricing, and the kind of sub-contract suggestion by the prime.

Ordnance encourages industry

To encourage voluntary effort by industry in advancing the state of the art, more than 900 copies of the Ordnance volume of the Army's *Research and Development Problems Guide* have been distributed to interested firms.

We are putting more emphasis upon supply inventory management. The function of calculating gross requirements has been centralized in an Ordnance management agency. A transceiver network and automatic processing equipment connect the national in-

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ventory control points. These have vastly improved the timeliness of data which develop supply requirements and, in turn, production requirements. Incidentally, they have speeded up and made more effective our supply operation, which was the real object.

I believe these illustrations indicate some measure of our determination to apply good business management principles in the Government's interest with no impairment of the reliability, timeliness and effectiveness of new weapons.

No quick and easy solutions

None of these are quick and easy solutions—you just don't find them in this complicated world. The manager and his engineers must have broad and certain knowledge of the possible ramifications of any new approach, and must exercise sound judgment. We must be willing to accept an occasional blooper in order to insure bold thinking, and we must be willing to exercise judgment. When we attempt to break out items, we must insist upon engineering compatibility, and that the functioning of closed loop elements has not been jeopardized. We cannot countenance any serious delay in system delivery. Finally, the technical package must support procurement.

There is considerable interest in value analysis in cost prevention and cost reduction. But this activity, too, must consider the basic requirements of reliable, maintainable and useful hardware. Whether you call it value analysis or consider it an extension of sound engineering and good management practice, the payoff in dollars saved cannot be justified in terms of inferior weapons.

The broad-brush treatment will not work in cost reduction. What will work, as I said earlier, is a painstaking analysis within each system of its components, and then the application of the best judgment of Ordnance and the contractor in the interest of conserving time, manpower, materials and funds.

In that continuing effort industry can be of great assistance to the defense establishment. We are mutually concerned with our country's survival and well-being. In the light of that stake, this is a challenge that demands our best—nothing else will do.

hot sparks

"STIMULATOR" is the name of a Ford Motor Co. periodic pamphlet that suggests "far out" ideas for military exploration. Latest brainstorm being pushed out the door to see if a 'chute opens is an idea for an amphibious, air-transportable bridge-builder that unrolls a ponton bridge out of the tailgate as it progresses through water. Bridge would consist of a number of accordion-folded, automatically inflatable airbags, capped by individual aluminum plates and held together by quick-disconnect cable sections. Parallel bridges could carry heavier traffic and bridges joined end-to-end for wider streams. Bridge would be anchored by steel pins driven into ground by powder charge. . . . **FIRST flight** of all glass fiber helicopter rotor blade announced by Kaman Aircraft. Company says significant improvement over other types, eliminating maintenance and overhaul problems due to corrosion and weathering. Cheaper, too. . . . **NAVY has it pretty soft.** Goodyear has delivered new type gangplank of air inflatable rubberized fabric which eliminates "shake, rattle and roll" of conventional metal planks. Being used on nuclear sub, T. Roosevelt. . . . **BULOVA up with a** new product line of small coils and transformers, mostly for military use. Frequencies from 200 KC to ten megs and size range from two stacked nickels to one-inch cube. Line's for use in high-performance radio and audio freq systems. . . . **VAPOR deposition process** for plating high-purity tungsten revealed by Bureau of Standards. Process promises to make possible use of tungsten's unusual high temperature structural strength. . . . **POTENTIAL Sergeant SSM** instructors studying at Sperry labs in Salt Lake City due to graduate and return to parent units this month. Course is training men requiring early know-how on the system. . . . **SPEECH now being transmitted** via infra-red rays, Minneapolis-Honeywell says. Spoken words "shot" from one point, unscrambled at another. Looks like cross between pistol and flashlight. If range is great enough, Army might use it hill-to-hill in Korea-type country—Navy could replace slower signal lamps with the word gun.

Jet Cargo Development

In the offing is a dual military-commercial long-range cargo aircraft with a maximum capacity of 70,000 pounds and the capability of taking off from a 6,000-foot runway.

An FAA-AF project, the cargo plane will be powered with turbofan jets and feature truck-bed height loading. In the military version, it will also have means for jumping paratroopers and dropping heavy equipment. Congress provided $30 million for the project in this fiscal year. The aircraft industry has been invited to bid on the development.

Half-Track Trucks

The Transportation Corps is turning dual-wheel deuce-and-a-half trucks into half-tracks by using a device obtained from the Canadian Army.

Called "Jungle Trac," the device is composed of crosspieces and links adjustable to differences in rear tire sizes and varying distances between axles. It takes only a short time to install.

The Army used Jungle Trac during Project Tropical Wet in Panama and when trucks were unable to move on standard tires, the tracks were installed. With the addition of tire chains on front wheels, a truck was able to pull a rolling fluid transporter and two ¾-ton trucks.

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ARMY books

DEVELOPMENT OF MILITARY POLICY

AMERICANS AT WAR: The Development of the American Military System. T. Harry Williams. Louisiana State University Press. 139 Pages; Illustrated; Index; $3.50.

Reviewed by

COL. DONOVAN P. YEUELL, a contributor to the recently published *A Forward Strategy for America.*

Neither part of the title accurately describes this book, for it is an easy-reading collection of interesting lectures studded with useful facts and bits of insight into American military affairs, from the Revolution through World War I.

The author outlines a phase of U. S. history which in our literature is barren indeed: the development of military policy and its direction at the seat of government. Dr. Williams offers rather thin fare to the serious student of this important subject. Many of the current mumblings about "civil control" of the military crop up repeatedly in accounts of the day of Washington, Polk, Lincoln, and Wilson. The issue then, as today, is mainly one of striking a workable balance between constituted civil authority and competent military leadership. Dr. Williams makes it clear how personalities always predominate in this equation.

The importance of recognizing grand strategy and the art of statesmanship as being broader than the preparation and fighting of military forces is of special interest in our age of protracted conflict, where the distinctions of peacetime and wartime are constantly blurred. Luckily, we have had a fair share (but hardly enough) of Presidents, Secretaries of War, and generals who recognized the interrelationships of overall strategy, national policy, and military power.

The proper role of the military in a democratic society is not easily definable even in the abstract. At worst, it can be the resultant of political abuse, military incompetence, and unusual stupidity. At best, it flows from a blend of intelligent and wise civilian authority and military competence acting in concert with eyes open to the future as well as the present, and mindful of the interests of the nation, the heritage of the past, and the possibilities of here and now.

In this book the perplexing strategic problems of an era that is neither peace nor war are discussed only in the last three pages. At a time when the world is in political ferment and the nuclear weapon is pointing toward outer space and back, the soldier and the strategic planner need all the help they can get in solving the problems of national security.

History can be a useful guide; even indispensable. But it has to be good history and it needs to cover the crucial course of the recent as well as the almost ancient. And if its main lesson is that America is great at solving her politico-military problems by improvization, then that kind of history is not worth the time to read. Not today, anyway.

GRANT FROM WEST TO EAST

STORMING OF THE GATEWAY. Lt. Col. Fairfax Downey. David McKay Company. 303 Pages; Illustrated; Maps; Index; $5.50.

THE WILDERNESS CAMPAIGN. Edward Steere. The Stackpole Company. 522 Pages; Maps; Index; $7.50.

LEE'S LAST CAMPAIGN. Clifford Dowdey. Little, Brown & Company. 415 Pages; Maps; Index; $6.00.

Reviewed by

MAJ. GEN. H. W. BLAKELEY, who has reviewed other works dealing with Grant and Lee.

By coincidence, these three books, from three different publishers, have continuity. Colonel Downey's deals with Grant and Bragg at Chattanooga and Chickamauga in the fall of 1863; Steere's picks up the story and concentrates on the Wilderness fighting of 5 and 6 May of the next year; Dowdey's overlaps in that he too covers the Wilderness and then carries the narrative to the beginning of the siege of Petersburg, with an epilogue to complete the story of Lee's last campaign.

Fairfax Downey is well known to most ARMY readers, and excerpts from his current book, under the title "Of Such Stuff Are Volunteers," were included in the October 1960 issue. His book's title comes from the fact that the Chattanooga campaign "flung wide the gateway to the southeast for Sherman's march to Atlanta and the sea." He says in his foreword that "as in earlier works, I have devoted chapters to the background and preliminaries of the culminating battles—to the setting for operations, to the character of the commanders and of the units they led, and to their arms and the manner of their use." Descriptions of terrain and of commanders' backgrounds and peculiarities are usual in military books, but few writers equal Colonel Downey in making units come to life, and particularly in the difficult art of describing weapons, their characteristics and limitations, and the problems (very real in weapons a hundred years ago) of loading, firing, and maintenance. The extensive appendices include lists of units that participated in the campaign and even poetry and songs of the period.

Steere's book is the fifth in the Civil War Campaigns series being brought out by Stackpole. Steere has spent most of his life as a historian with the National Parks Service. The Wilderness campaign is of particular interest because it was the first encounter between Grant and Lee, because of the command problem incident to the placing of the field headquarters of the Armies of the United States with that of the Army of the Potomac, and because of the controversies regarding the proper employment of cavalry. A book that is primarily a detailed study of two days of combat cannot be easy reading in any case, and there have been few battles in which units were more mixed and scattered than in the tangled thickets of the Wilder-

ness. This book is for serious students of the Civil War.

In the third book, Mr. Dowdey, an experienced writer whose principal subject has been the Confederacy, also tells the story of the Wilderness fighting more briefly and not always in complete agreement with Mr. Steere. Lee in his difficult relations with Jefferson Davis, and Lee as revealed in letters to his wife and daughters are two themes well developed in this work. Incidentally, the bibliographical essay at the end of the book should be read first.

LATEST ON SMALL ARMS

THE BOOK OF PISTOLS & REVOLVERS. 718 Pages; Illustrated; Index; $10.00. THE BOOK OF RIFLES. 576 Pages; Illustrated; Index. By Walter H. B. Smith. The Stackpole Company.

Reviewed by

COLONEL S. LEGREE.

Comparing *The Book of Revolvers and Pistols* with the 1946 edition of *The NRA Book of Small Arms: Volume I, Pistols and Revolvers,* is almost a philosophical experience. W. H. B. Smith, author of the original work, has passed on. The Military Service Publishing Company is now the Military Service Division of The Stackpole Company. The National Rifle Association no longer owns the copyright. Richard Gordon McCloskey, editor of the original edition, has been telling the story of American democracy overseas for the U. S. Information Agency for many years.

Most of the original text still stands, and most of the original illustrations still are used, because the original materials were accurate and well conceived. The pictures in this fourth edition are clearer only because of better printing. Supplemental material, by Kent Bellah, who also brought some of Mr. Smith's work up to date, includes a note on home-made zip guns, information on the unfortunate Kimball pistols, and the latest on more standard weapons as well.

The Book of Rifles, a second edition, rather than a fourth, brings the original 1948 NRA edition up to date. William Piznak prepared the supplemental material for this new edition.

Both books are a service to the shooting fraternity, and the price is a tribute to Stackpole's method of production. The company's integrated production facilities make low prices possible. If reference to one of these volumes prevents a novice from one false move in buying firearms, he has saved the price of both, plus much frustration, and even possible danger.

These are basic books for the shooter and arms collector. Owners of previous editions will face a real dilemma, but this is not "planned obsolescence"; it is a successful move to bring two reference works of the 1940s up to 1960 standards.

PEKING'S DECISION TO FIGHT

CHINA CROSSES THE YALU. Allen S. Whiting. The Macmillan Company. 219 Pages; Maps; Index; $7.50.

Reviewed by

LT.COL. ROY E. APPLEMAN, who wrote *South to the Naktong, North to the Yalu,* the first volume in the Army's history of the Korean War.

This book attempts to reconstruct the viewpoint of Peking and to trace the development of Communist China's policy toward the Korean War to the end of November 1950. In this analysis the author relies heavily on Chinese newspapers and magazines that printed the official reaction to unfolding events as they were expressed and interpreted for public consumption. Mr. Whiting has also used important American sources, including two unpublished manuscripts of the Department of the Army, the Marine Corps' published history, and the records published by the UN.

The author does not arrive at any final conclusions, explaining that his sources are not sufficient for that purpose. Necessarily, his postulates of the interplay of motives and pressures for and on various decisions and actions between the two great Communist powers, and their respective parts in Korea, are tentative and inconclusive.

He does reach the conclusion, however, that a Soviet dictate to Peking was not necessary to bring the latter into the war. He argues that from a position of being merely an interested bystander when the war began, and probably having no responsibility for its inception, Red China gradually began to see the war as affecting its vital interests, and its policy gradually changed to reflect this. Mr. Whiting believes "the final decision to fight appears to have been basically a Chinese decision, conditioned by Russian advice and encouraged by Russian support." The implementation of this decision is seen as hinging on the UN forces crossing the 38th parallel.

An important argument is that both Red China and the United States failed to communicate adequately to each other their intentions, and that both accordingly miscalculated each other's motives and objectives. This leads to the conclusion that the Chinese intervention was caused in part by a breakdown of communications.

Because of his position as a member of the staff of the RAND Corporation, the author had access to detailed manuscript materials on the Korean War in the Office of the Chief of Military History. He cites these sources in his rather brief references to military operations on the peninsula. This section reflects a marked degree of carelessness. For example, Whiting says the UN counteroffensive from the Pusan perimeter began on 15 September,

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the same day as the Inchon landing. Later he says it was two days after. Neither is correct; it was 16 September. It was not a battalion of the 7th Regiment, ROK 6th Division, that entered Chosan on the Yalu on 26 October, but only a reconnaissance platoon of that battalion. The CCF action against the ROK forces on the right flank of Eighth Army in October is completely misunderstood. The author says, "As South Korean forces fought their way back to Unsan, forty-five miles below the border, they encountered new ambushes by CPV troops who had infiltrated behind their lines." No such action occurred. The Chinese had taken position at Unsan and there stopped and defeated the ROK 1st Division and part of the 1st Calvary Division that moved up to support it. There was no retreat to Unsan from the Yalu. The UN troops never got beyond Unsan in that sector during this phase of the war. Except for the one ROK regiment that had neared the Yalu by way of the Huich'on-Onjong road axis east of Unsan and had sent its reconnaissance platoon into Chosan, the ROK troops were stopped on a line running east-west through Unsan and Onjong. The author states at different places that Chinese and UN troops first engaged each other on 26 October, both in the east and in the west. Actually, in both sectors the initial action was a day earlier. Whiting says that between late October and the Chinese counteroffensive of late November more than 200,000 CCF troops entered Korea. I believe the number was about 120,000.

Fortunately for the book's value, the space and attention given to military action is minor and the unreliable nature of this part does not seriously impair the remainder.

As a study of the forces at work that influenced Peking's decision to enter the Korean War, this book inquires into most of them and tries to evaluate their relative importance. Mr. Whiting does not engage in wild conclusions. He is cautious and circumspect throughout. As he says, "Only future historians with access to archives of the People's Republic of China can attest the validity of this [Whiting's] analysis."

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